

JANUARY, 1931

25 Cents, \$1 a Year

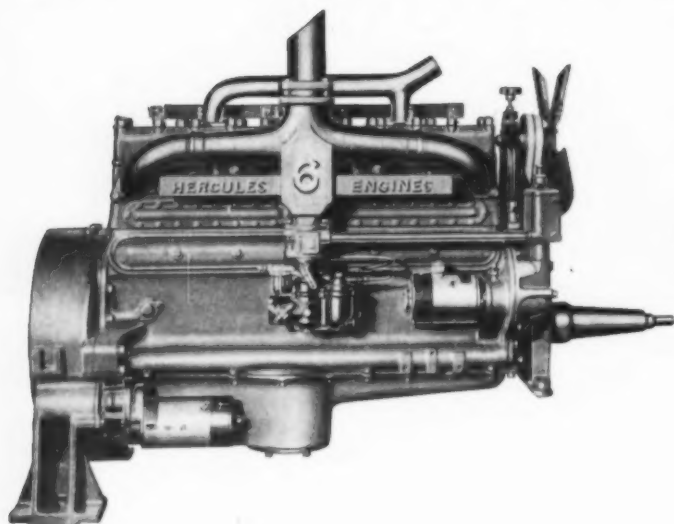
# Contractors *and* Engineers Monthly

7TH TIER

Heavy Grading  
on a  
California Project  
see page 73

Including  
The  
Consulting  
Engineer

# HERCULES ENGINES



## THE "HX" SERIES OF SIXES

**H**ERCULES "HX" Series Engines have been developed with a particular view to meeting modern requirements for heavy-duty, six-cylinder power in the higher horsepower ranges.

Like all Hercules Engines they are simple, rugged, advanced in engineering. Special attention has been given to effective cooling and lubrication.

Full provision has been made for all possible accessories.

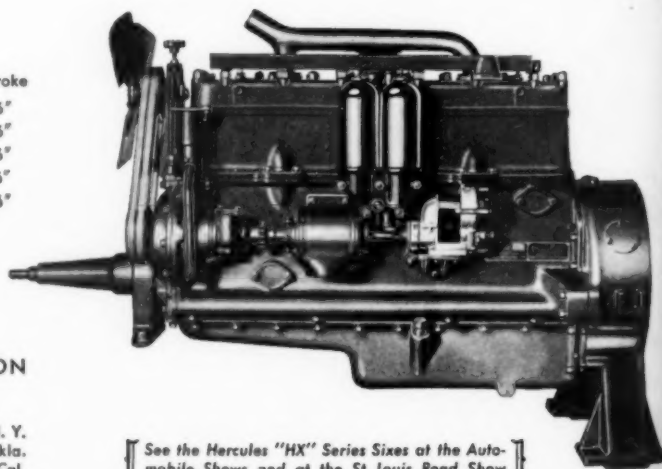
The reputation for all-around superiority which Hercules Engines have earned throughout the heavy-duty power field is still further enhanced by the "HX" Series Sixes. Complete information and details will gladly be furnished on request.

### SPECIFICATIONS

Model	Cylinders	Bore	Stroke
HXA	6	4-3/4"	6"
HXB	6	5"	6"
HXC	6	5-1/4"	6"
HXD	6	5-1/2"	6"
HXE	6	5-3/4"	6"

**HERCULES MOTORS CORPORATION**  
Canton, Ohio, U. S. A.

New York Office: Chanin Building, New York, N. Y.  
Mid-Continent Office: Mayo Building, Tulsa, Okla.  
West Coast Office: Russ Building, San Francisco, Cal.



[[ See the Hercules "HX" Series Sixes at the Automobile Shows and at the St. Louis Road Show ]]



FAMILY

S

Year  
by  
A.



# Pacemakers in this Age of Speed

**S**PEED is absolutely the essential element in a wheelbarrow and the foundation for speed is strength, rigidity, balance—without these elements there cannot be speed.

General Wheelbarrows have speed built into them because our design, our construction presages brute strength, rugged durability and a rigidity and balance that makes General Wheelbarrows the speediest barrows in use today.

Therefore, General Wheelbarrows are not ordinary barrows. They are definitely beyond any such standard of comparison, entirely out of such a classification and obviously are entitled to a distinction entirely their own.

We have always given our barrows the distinction of the orange handles and we intend to continue this and go a step further and name them Speedbarrows—a name that immediately means strength, rigidity, balance and speed.

## GENERAL WHEELBARROW COMPANY

Makers of Speedbarrows and Concrete Carts, Road Grader Blades, Scrapers, Steel Mortar Boxes, Salamanders, Coal Chutes, Agricultural Implements, Plow Shapes  
3140 EAST 65TH STREET, CLEVELAND, OHIO

Associated Companies: GENERAL WHEELBARROW COMPANY  
THE EMPIRE PLOW COMPANY



No. 4-A Standardized Concrete Speedbarrow.

No. 4-B is same except tubular handles.

Complete interchangeability. Unconditionally guaranteed.

# Speedbarrows

The Wheelbarrow with Orange Handles

When writing to advertisers please mention the CONTRACTORS AND ENGINEERS MONTHLY—Thank You.

# WHERE TO PURCHASE

## Blades, Grader and Snow Plow

- \*Austin-Western Road Machy. Co., Chicago
- \*Caterpillar Tractor Co., Peoria, Ill.
- \*General Wheelbarrow Co., Cleveland, Ohio
- \*Good Roads Machinery Co., Kennett Sq., Pa.
- \*Riddell Co., W. A., Bucyrus, Ohio
- \*Shunk Mfg. Co., Bucyrus, Ohio
- Adams Co., J. D., Indianapolis, Ind.
- Beach Mfg. Co., Charlotte, Mich.
- Gallon Iron Wks. & Mfg. Co., Gallon, Ohio
- Western Wheeled Scraper Co., Aurora, Ill.

## Blast Hole Drills (See Drills)

## Blasting Powder (See Powder, Black)

## Block Machines, Concrete

- \*Lansing Co., Lansing, Mich.
- Abrams Cement Tool Co., Detroit, Mich.
- Cement Block Machine Co., Newark, N. J.
- Foots Fdy. Co., J. B., Fredericktown, Ohio
- Zagelmeyer Cast Stone Block Machy. Co., Bag City, Mich.

## Block Paving, Asphalt

- Asphalt Brick Co., St. Louis, Mo.
- Hastings Pavement Co., New York

## Block Paving, Brick (See Brick)

## Block Paving, Granite

- Fletcher Co., H. E., West Chelmsford, Mass.
- Leopold & Co., J., New York
- Long-Blue Granite Quarries, Inc., Elberton, Ga.
- Maine & N. H. Granite Corp., N. Jay, Maine
- Winconsin Granite Co., Chicago
- Woodbury Granite Co., Hardwick, Vt.

## Block Paving, Rubber

- \*Serviced Premoulded Prod., Inc., Chicago
- Wright Rubber Prod. Co., Racine, Wis.

## Block Paving, Wood

- Jennison-Wright Co., Toledo, Ohio
- Pacific Creco Co., Seattle, Wash.
- Republic Creco Co., Indianapolis, Ind.
- Southern Wood Pres. Co., Atlanta, Ga.
- White Lumber Co., J. J., Columbia, Miss.
- Wyckoff Pipe & Creco Co., New York

## Blocks and Tackle (See also Chains, Block, and Rope, Manila)

- \*Clyde Iron Works Sales Co., Duluth, Minn.
- \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- \*Ebel Hoist and Pump Co., Lansing, Mich.
- \*Lidgerwood Mfg. Co., Elizabeth, N. J.
- \*Western Block Co., Lockport, N. Y.
- \*Williamsport Wire Rope Co., Chicago
- American Hoist & Der. Co., St. Paul, Minn.
- Boston & Lockport Block Co., Boston, Mass.
- Fridly Hoist & Machy. Co., Mountville, Pa.
- Haise Mfg. Co., Inc., Geo., New York
- Iowa Mfg. Co., Cedar Rapids, Iowa
- Leschen & Sons Rope Co., St. Louis, Mo.
- Roebing's Sons Co., John A., Trenton, N. J.
- Stuebner Iron Wks., G. L., Long Is. City, N. Y.
- Upson-Walton Co., Cleveland, Ohio

## Blocks, Wood, Creosoted (See Wood, Creosoted, and Block Paving, Wood)

## Blocks, Sewer, Segment

- American Vit. Prods. Co., Akron, Ohio
- Dickey Clay Mfg. Co., W. S., Kansas City, Mo.
- Evans & Howard Fire Brick Co., St. Louis, Mo.
- Laclede Christy Clay Prod. Co., St. Louis, Mo.
- Pacific Clay Prod. Co., Los Angeles, Calif.
- Red Wing Sewer Pipe Co., Red Wing, Minn.
- Robinson Clay Prod. Co., Akron, Ohio
- Streator Clay Mfg. Co., Streator, Ill.
- Washington Brick, Lime & Sewer Pipe Co., Spokane, Wash.

## Blow Torches (See Torches)

## Blowpipes, Cutting and Welding (See Welding Apparatus, Acetylene)

## Blueprint Machines

- Bruning Co., Charles, New York
- Paragon-Revolute Corp., Rochester, N. Y.
- Pease Co., O. F., Chicago
- Shaw Blue Print Mach. Co., Campbell, N. J.
- Wickes Bros., Saginaw, Mich.

## Bodies, Concrete, Agitator and Mixer

- \*Blaw-Knox Co., Pittsburgh, Pa.
- \*Chain Belt Co., Milwaukee, Wis.
- \*Davis, Inc., Norris K., San Francisco, Calif.
- \*Good Roads Machy. Corp., Kennett Sq., Pa.
- \*Jaeger Machine Co., Columbus, Ohio
- Arrow Sand & Gravel Co., Columbus, Ohio
- Bartlett & Snow Co., C. O., Cleveland, Ohio
- Barrymore Conc. Mixer Corp., San Francisco, Calif.

- Biehl Iron Works, Reading, Pa.
- Highway Truck Mixer Co., Cleveland, Ohio
- Lee Transit Mixer Co., Indianapolis, Ind.
- Parke Conc. Carrier, Inc., New York
- Transit Mixers, Inc., San Francisco, Calif.
- Truck Mixer Co., Columbus, Ohio

## Bodies, Dump, for Motor Trucks

- \*Nelson Iron Works, N. P., Passaic, N. J.
- \*Wood Hydr. Hoist & Body Co., Detroit
- American Cement Mach. Co., Keokuk, Iowa
- American Truck Body Co., Martinsville, Va.
- Anthony Co., Streator, Ill.
- Bartlett & Snow Co., C. O., Cleveland, Ohio
- Columbian Steel Tank Co., Kansas City, Mo.
- Commercial Shearing & Stamping Co., Youngstown, Ohio
- Ditwiler Mfg. Co., Gallon, Ohio
- Eagle Wagon Works, Auburn, N. Y.
- Gallon All Steel Body Co., Gallon, Ohio
- Heil Co., Milwaukee, Wis.
- Hercules Products Co., Evansville, Ind.
- Highway Trailer Co., Edgerton, Wis.
- Hockensmith Wheel & Mine Car Co., Penn. Pa.
- Hug Co., The, Highland, Ill.
- Jennings Auto. Dump Body Co., Roanoke, Va.
- Lee Trailer & Body Co., Plymouth, Ind.
- Marion Steel Body Co., Marion, Ohio
- Superior Body Corp., Marion, Ind.
- Van Dorn Iron Works Co., Cleveland, Ohio

## Bodies, Dump, Tractor-Mounted

- \*Austin-Western Rd. Mach. Co., Chicago
- \*Koehring Co., Milwaukee, Wis.
- \*Winsor Co., Bucyrus, Ohio
- Hughes-Keenan Co., Mansfield, Ohio

## Boilers

- \*Clyde Iron Works Sales Co., Duluth, Minn.
- \*Manitowoc Engg. Wks., Manitowoc, Wis.
- Babeock & Wilcox Co., New York
- Burnham Boiler Corp., Irvington, N. Y.
- Cole Mfg. Co., R. D., Newnan, Ga.
- Erie City Iron Wks., Erie, Pa.
- Hartley Boiler Wks., Montgomery, Ala.
- Hedges-Walsh-Weidner Co., Chattanooga, Tenn.
- Heine Boiler Co., St. Louis, Mo.
- Johnston Bros., Inc., Ferrysburg, Mich.
- Keeler Co., J. Williamsport, Pa.
- Leffel & Co., Jan., Springfield, Ohio
- Murray Iron Wks. Co., Burlington, Iowa
- Nagle Eng. & Boiler Works, Erie, Pa.
- Orr & Senbower, Reading, Pa.
- Schofield's Sons Co., J. S., Macon, Ga.
- Stanwood Corp., Cincinnati, Ohio
- Vogt Machinery Co., Inc., Louisville, Ky.

## Boxes, Batch

- \*Blaw-Knox Co., Pittsburgh, Pa.
- \*Honhorst Co., Jos., Cincinnati, Ohio
- \*Lakewood Engg. Co., Columbus, Ohio
- \*Littleford Bros., Cincinnati, Ohio
- Easton Car & Const. Co., Easton, Pa.
- Erie Steel Const. Co., Erie, Pa.
- Western Wheeled Scraper Co., Aurora, Ill.

## Boxes, Mortar

- \*General Wheelbarrow Co., Cleveland, Ohio
- \*Heltzel Steel Form & Iron Co., Warren, Ohio
- \*Lansing Co., Lansing, Mich.
- \*Littleford Bros., Cincinnati, Ohio
- Anchor Mfg. Co., Chicago, Ill.
- Beatrice Steel Tank Mfg. Co., Beatrice, Neb.
- Donley Bros. Co., Cleveland, Ohio
- Empire Metal Tank Works, E. Rochester, N. Y.
- Fairbanks Co., New York
- Hancock Iron Works, Pontiac, Mich.
- Jackson Mfg. Co., Harrisburg, Pa.
- Red Star Prods. Corp., Cleveland, Ohio
- Truscon Steel Co., Youngstown, Ohio

## Braces, Trench

- \*Templeton, Kenly & Co., Chicago
- Channon Mfg. Co., Jas. H., Chicago
- Duff-Norton Mfg. Co., Pittsburgh, Pa.
- Kalamazoo Fdy. & Mach. Co., Kalamazoo, Mich.

## Branding Tools

- Everhot Mfg. Co., Maywood, Ill.

## Brass Goods

- Waterbury Brass Goods Corp., Waterbury, Conn.
- Bridgeport Brass Co., Bridgeport, Conn.
- Chase Brass & Cop. Co., Inc., Waterbury, Conn.
- Glauber Brass Mfg. Co., Cleveland, Ohio
- Haydensville Co., Haydensville, Mass.
- Hays Mfg. Co., Erie, Pa.
- Mueller Co., Decatur, Ill.
- Smith Mfg. Co., A. P., East Orange, N. J.
- Union Water Meter Co., Worcester, Mass.
- United-Obendorff Corp., Cleveland, Ohio

## Breakers, Concrete, Pneumatic (See Tools, Pneumatic)

## Brick, Paving, Vitrified

- Alton Brick Co., Alton, Ill.
- Buffalo Brick Co., Buffalo, Kans.
- Cleveland Brick & Clay Co., Cleveland, Ohio
- Collinwood Shale Brick Co., Cleveland, Ohio
- Corry Brick & Tile Corp., Corry, Pa.
- Crescent Brick Co., Pittsburgh, Pa.
- Georgia Vit. Brick Co., Augusta, Ga.
- Globe Brick Co., E. Liverpool, Ohio
- Hammond Fire Brick Co., Fairmont, W. Va.
- Hysylvania Coal Co., Columbus, Ohio
- Hocking Valley Brick Co., Columbus, Ohio
- McAvoy Brick Co., Bridgeville, Pa.
- Mayer Brick Co., Bridgeville, Pa.
- Metropolitan Paving Brick Co., Canton, Ohio
- Murphysboro Pav. Brick Co., Murphysboro, Ill.
- National Pav. Brick Mfrs. Assn., Washington
- Patton Clay Mfg. Co., Patton, Pa.
- Paxton Brick Co., Watsontown, Pa.
- Peebles Paving Brick Co., Portsmouth, Ohio
- Peoria Brick & Tile Co., Peoria, Ill.
- Purinton Pav. Brick Co., Galesburg, Ill.
- Ross Shale Brick Co., Veedersburg, Ill.
- So. Clay Mfg. Co., Chattanooga, Tenn.
- Springfield Paving Brick Co., Springfield, Ill.
- Sterling Brick Co., Olean, N. Y.
- Streator Clay Mfg. Co., Streator, Ill.
- Terre Haute Vit. Brick Co., Terre Haute, Ind.
- Thornton Fire Brick Co., Clarksburg, W. Va.
- Thurber Brick Co., Thurber, Texas
- Toronto Fire Clay Co., Toronto, Ohio
- Trinidad Brick & Tile Co., Trinidad, Ohio
- United Clay Products Corp., Kansas City, Mo.
- Western Shale Prods. Co., Ft. Scott, Kans.

## Bridge Floors (See Flooring, Bridge; Block Paving, Wood; Wood, Creosoted)

## Bridges, Traveling, for Road Work

- \*Heltzel Steel Form & Iron Co., Warren, Ohio
- \*Lakewood Engg. Co., Columbus, Ohio

## Brooms, Hand

- \*Hvass & Co., Chas., New York
- Durlach Can & Iron Wks., Brooklyn, N. Y.
- Kendallville Brush & Broom Co., Kendallville, Ind.
- Lay Co., Joseph, Portland, Ind.
- Milwaukee Brush Mfg. Co., Milwaukee, Wis.
- Mohawk Asphalt Heater Co., Schenectady, N.Y.
- Oshorn Mfg. Co., Cleveland, Ohio
- Wolfe Brush Co., Pittsburgh, Pa.

## Bucket Conveyors (See Conveyors)

## Bucket Elevators (See Elevators)

## Bucket Excavators (See Excavators or Conveyors)

## Buckets, Automatic Dumping

- \*Insley Mfg. Co., Indianapolis, Ind.
- \*Lakewood Engg. Co., Columbus, Ohio
- \*Williamsport Wire Rope Co., Williamsport, Pa.
- Biehl Iron Works Corp., Reading, Pa.
- Link-Belt Co., Chicago
- Stuebner Iron Wks., Inc., G. L., L. I. City, N. Y.
- Union Iron Works, Inc., Hoboken, N. J.

## Buckets, Cableway, Slackline

- \*Blaw-Knox Co., Pittsburgh, Pa.
- \*Hayward Co., New York
- \*Sauerman Bros., Chicago, Ill.
- \*Street Bros. Mach. Wks., Chattanooga, Tenn.
- \*Williams Co., G. H., Erie, Pa.
- Beaumont Co., R. H., Philadelphia
- Godfrey Conveyor Co., Elkhart, Ind.
- Harnischfeger Corp., Milwaukee, Wis.
- Link-Belt Co., Chicago
- Monighan Mfg. Corp., Chicago

## Buckets, Clam-Shell

- \*Blaw-Knox Co., Pittsburgh, Pa.
- \*Hayward Co., New York
- \*Lakewood Engg. Co., Columbus, Ohio
- \*Manitowoc Engg. Works, Manitowoc, Wis.
- \*Williams Co., G. H., Erie, Pa.
- Browning Crane Co., Cleveland, Ohio
- Erie Steel Const. Co., Erie, Pa.
- Hais Mfg. Co., Geo., New York
- Industrial Brownhoist Corp., Cleveland
- Kiesler Co., J. F., Chicago
- Link-Belt Co., Chicago, Ill.
- Mead-Morrison Mfg. Co., E. Boston, Mass.
- Orton Crane & Shovel Co., Chicago
- Owen Bucket Co., Cleveland, Ohio
- Page Engg. Co., Chicago

## Buckets, Hoist, Concrete

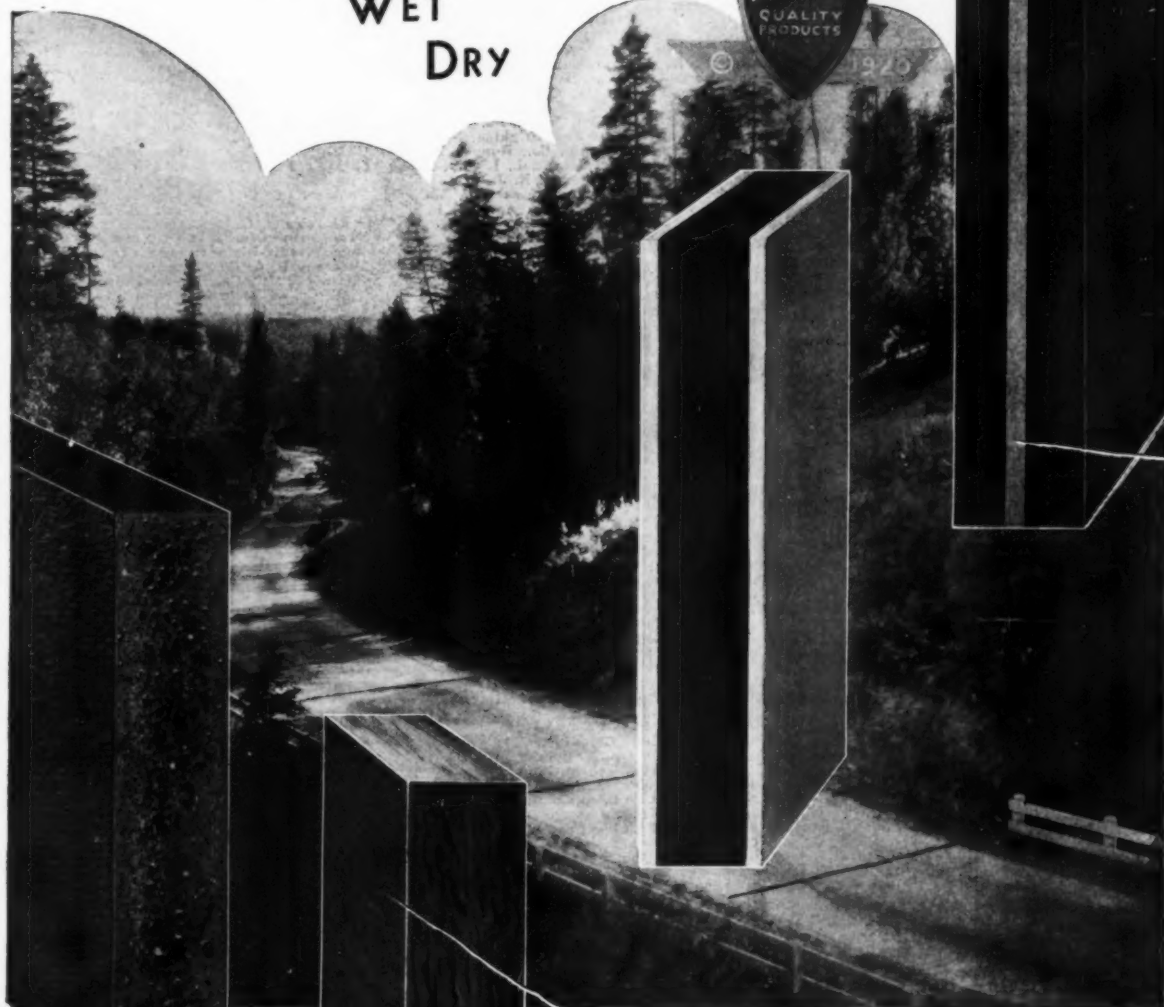
- \*Davis, Inc., Norris K., San Francisco, Calif.
- \*Insley Mfg. Co., Indianapolis, Ind.
- \*Jaeger Machine Co., Columbus, Ohio
- \*Lakewood Engg. Co., Columbus, Ohio
- \*Ransome Conc. Machy. Co., Dunellen, N. J.
- Stuebner Ir. Wks., Inc., G. L., L. I. City, N.Y.
- Union Iron Works, Inc., Hoboken, N. J.

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover \*



# FOR EVERY CONDITION

HOT  
COLD  
WET  
DRY



The Serviced Sponge Rubber Expansion Joint is the most perfect protection from severe water conditions and extreme heat. A non-oozing super-elastic joint material—impervious to water.

Type "B" Serviced Expansion Joints are of special quality asphalt and selected fibres—very low in moisture absorption—maximum elasticity and plasticity—minimum of oozing—long life and resistant to traffic wear.

Reinforced Serviced Expansion Joints were developed for requirements demanding rigidity and strength in fillers. The core of fiber is heavily saturated with high quality asphalt and reinforced on the sides by sheets of saturated felt—a quality joint for certain conditions.

Serviced Center-Core Expansion Joints of fibrated asphalt take up expansion and contraction and assure waterproofing by close adhesion to the pavement proper. The fiber center core reinforces and furnishes elasticity while the fibrated asphalt sides guarantee adhesion to the pavement slab.

Write us of your conditions and get our recommendations.

## SERVICISED PREMOULDED PRODUCTS, INC.

GENERAL DISTRIBUTORS For Products Manufactured by  
**SERVICISED PRODUCTS CORPORATION**

FACTORIES AND SALES OFFICES

Chicago Sandusky, Ohio Wilmington, Del.  
53 W. Jackson Blvd. 1st and Sandusky Sts. Church and F. Sts.

# WHERE TO PURCHASE

## Buckets, Dredging

\*Blaw-Knox Co., Pittsburgh, Pa.  
 \*Hayward Co., New York  
 \*Lakewood Engg. Co., Columbus, Ohio  
 \*Williams Co., G. H., Erie, Pa.  
 Browning Crane Co., Cleveland, Ohio  
 Erie Steel Const. Co., Erie, Pa.  
 Hais Mfg. Co., George, New York  
 Industrial Brownhoist Corp., Cleveland, Ohio  
 Kiesler Co., J. F., Chicago  
 Link-Belt Co., Chicago  
 Orton Crane & Shovel Co., Chicago  
 Owen Bucket Co., Cleveland, Ohio  
 Stockton Iron Works, Stockton, Calif.

## Buckets, Orange Peel

\*Hayward Co., New York  
 Industrial Brownhoist Corp., Cleveland, Ohio  
 Orton Crane & Shovel Co., Chicago

## Buildings, Steel, Portable

\*Blaw-Knox Co., Pittsburgh, Pa.  
 \*Littleford Bros., Cincinnati, Ohio  
 Beatrice Steel Tank Mfg. Co., Beatrice, Neb.  
 St. Paul Corrugating Co., St. Paul, Minn.  
 Superior Engg. Co., Warren, Ohio  
 Truscon Steel Co., Youngstown, Ohio

## Dozers

\*Baker Mfg. Co., Springfield, Ill.  
 \*Euclid Crane & Hoist Co., Euclid, Ohio  
 \*Trackson Co., Milwaukee, Wis.  
 Blair Mfg. Co., W. M., Chicago  
 Essex Engine & Machine Co., Belleville, N. J.  
 LaPlant-Choate Mfg. Co., Cedar Rapids, Iowa  
 Miami Trailer-Scraper Co., Troy, Ohio  
 Niess & Co., Inc., Minneapolis, Minn.  
 W-K-M Co., Houston, Texas

## Bunks and Cots

Ft. Pitt Bedding Co., Pittsburgh, Pa.  
 Haggard & Matsumoto Co., Chicago  
 Logan Co., Louisville, Ky.  
 Royal Blue Bed Spring Co., Cincinnati, Ohio  
 Seattle Tent, Awning Co., Seattle, Wash.  
 Simmons Co., New York  
 Southern-Rome Co., Baltimore, Md.

## Burlap

\*Fulton Bag & Cotton Mills, Atlanta, Ga.  
 American Sack Corp., Chicago  
 Eastern Burlap Bag Co., Hartford, Conn.  
 Menie & Co., Inc., New Orleans, La.  
 Upson-Walton Co., Cleveland, Ohio

Cable (See Wire and Cable, Electric, or Rope, Wire)

## Cableway Buckets, Slackline (See Buckets)

## Cableways, Dragline

\*Lidgerwood Mfg. Co., Elizabeth, N. J.  
 \*McKiernan-Terry Corp., New York  
 \*Pioneer Gravel Equip. Mfg. Co., Minneapolis  
 \*Sauerman Bros., Chicago  
 \*Street Bros. Mach. Works, Chattanooga, Tenn.  
 Amer. Hoist & Derrick Co., St. Paul, Minn.  
 Beach Mfg. Co., Charlotte, Mich.  
 Beaumont Co., R. H., Philadelphia  
 Green, L. P., Chicago  
 Iowa Mfg. Co., Cedar Rapids, Iowa  
 Link-Belt Co., Chicago  
 Pioneer Gravel Equip. Mfg. Co., Minneapolis

## Cableways, Slackline

\*Lidgerwood Mfg. Co., Elizabeth, N. J.  
 \*McKiernan-Terry Corp., New York  
 \*Mundy Hoisting Eng. Co., J. S., Newark, N. J.  
 \*Sauerman Bros., Inc., Chicago  
 \*Street Bros. Mach. Works, Chattanooga, Tenn.  
 Beaumont Co., R. H., Philadelphia, Pa.

## Cabs, Motor Truck

Highland Body Mfg. Co., Cincinnati, O.  
 Martin-Parry Corp., York, Pa.  
 Moline Mfg. Co., Moline, Ill.  
 Stewart Iron Works Co., Cincinnati, O.  
 Weatherproof Body Corp., Corunna, Mich.

## Caissons

American Bridge Co., New York  
 Biggs Boiler Wks. Co., Akron, Ohio  
 Birmingham Tank Co., Birmingham, Ala.  
 Petroleum Iron Works Co., Sharon, Pa.  
 Pittsburgh-Des Moines Stl. Co., Pittsburgh, Pa.

## Calcium Chloride

\*Columbia Products Co., Barberton, Ohio  
 \*Dow Chemical Co., Midland, Mich.  
 \*Solvay Sales Corp., New York  
 Michigan Alkali Co., New York

## Calcium Chloride Spreaders (See Spreaders)

## Calking Compounds (See Compounds)

## Calking Machinery and Tools

\*Independent Pneu. Tool Co., Chicago  
 \*Schramm, Inc., West Chester, Pa.  
 Chicago Pneu. Tool Co., New York

Helwig Mfg. Co., St. Paul, Minn.  
 Ingersoll-Rand Co., New York  
 Mueller Co., Decatur, Ill.  
 Smith Mfg. Co., A. P., East Orange, N. J.

## Canvases

\*Fulton Bag & Cotton Mills, Atlanta, Ga.  
 Canvases Prods. Co., St. Louis, Mo.  
 Daniels, Inc., C. R., New York  
 Goss Co., J. C., Detroit, Mich.

## Car Unloaders (See Unloaders)

## Cars, Industrial Railway

\*Insley Mfg. Co., Indianapolis, Ind.  
 \*Lakewood Engg. Co., Columbus, Ohio  
 Atlas Car & Mfg. Co., Cleveland, Ohio  
 Chase Crane & Engg. Co., Columbus, Ohio  
 Chase Fdy. & Mfg. Co., Columbus, Ohio  
 Easton Car & Const. Co., Easton, Pa.  
 Hunt Co., C. W., West New Brighton, N. Y.  
 Koppel Ind. Car & Equip. Co., Koppel, Pa.  
 Stuebner Ir. Wks., Inc., G. L., L. I. City, N. Y.  
 Union Iron Works, Hoboken, N. J.  
 United Iron Works, Inc., Kansas City, Mo.  
 Western Wheeled Scraper Co., Aurora, Ill.  
 Whiting Corp., Harvey, Ill.

## Carts, Concrete

\*General Wheelbarrow Co., Cleveland, Ohio  
 \*Insley Mfg. Co., Indianapolis, Ind.  
 \*Lakewood Engg. Co., Columbus, Ohio  
 \*Lansing Co., Lansing, Mich.  
 \*Ransome Conc. Machy. Co., Dunellen, N. J.  
 Acme Road Machy. Co., Frankfort, N. Y.  
 Chattanooga Wheelbarrow Co., Chattanooga, Tenn.  
 Gray Iron Fdy. Co., Reading, Pa.  
 Jackson Mfg. Co., Harrisburg, Pa.  
 Red Star Prods. Corp., Cleveland, Ohio  
 Sterling Wheelbarrow Co., Milwaukee, Wis.  
 Toledo Wheelbarrow Co., Toledo, Ohio

## Carts, Dump (See Wagons)

## Cast Iron Pipe (See Pipe)

## Cast Iron Culverts (See Culverts or Pipe)

## Castings, Steel

\*Chain Belt Co., Milwaukee, Wis.  
 \*Foote Bros. Gear & Mach. Co., Chicago  
 \*Riddell Co., W. A., Bucyrus, Ohio  
 Alloy Cast Steel Co., Marion, Ohio  
 Amer. Manganese Stl. Co., Chicago Hgts, Ill.  
 Farrell Cheek Steel Fdy. Co., Sandusky, Ohio  
 Hardie-Tynes Mfg. Co., Birmingham, Ala.  
 Otis Steel Co., Cleveland, Ohio  
 Rogers Iron Wks. Co., Joplin, Mo.  
 Wheeling Mold & Fdy. Co., Wheeling, W. Va.

## Castings, Street and Sewer

\*Burch Corp., The, Crestline, Ohio  
 \*Central Foundry Co., New York  
 \*U. S. Pipe & Fdy. Co., Burlington, N. J.  
 Clark Co., H. W., Mattoon, Ill.  
 Clarksville Fdy. & Mach. Co., Clarksville, Tenn.  
 Clow & Sons, J. B., Chicago  
 Dee Co., Wm. E., Chicago  
 Donley Bros. Co., Cleveland, Ohio  
 Flockhart Fdy. Co., Newark, N. J.  
 Fulton Iron Works, St. Louis, Mo.  
 Lake Shore Eng. Works, Marquette, Mich.  
 Rogers Iron Wks. Co., Joplin, Mo.  
 Sessions Fdy. Co., Bristol, Conn.  
 South Bend Fdy. Co., South Bend, Ind.

## Catch Basins (See Castings, Street and Sewer)

## Cement

\*Columbia Cem. Div. of Pittsburgh Plate Glass Co., Pittsburgh  
 \*Universal Atlas Cement Co., Chicago  
 Acme Cement Corp., Catskill, N. Y.  
 Aetna P. C. Co., Detroit, Mich.  
 Allentown P. C. Co., Catasauqua, Pa.  
 Alpha P. C. Co., Easton, Pa.  
 Ash Grove Lime & P. C. Co., Kansas City, Mo.  
 Atlas P. C. Co., New York  
 Beaver P. C. Co., Portland, Ore.  
 Bessemer Limestone & C. Co., Youngstown, O.  
 British Columbia Cement Co., Victoria, B. C.  
 Canada Cement Co., Ltd., Montreal, Canada  
 Colorado P. C. Co., Denver, Colo.  
 Consolidated Cement Corp., Chicago  
 Cowell P. C. Co., Cowell, Cal.  
 Crescent P. C. Co., Wampum, Pa.  
 Dewey P. C. Co., Kansas City, Mo.  
 Diamond P. C. Co., Cleveland, Ohio  
 Edison P. C. Co., New York  
 Georgia Cement & Stone Co., Birmingham, Ala.  
 Giant P. C. Co., Philadelphia  
 Glens Falls P. C. Co., Glens Falls, N. Y.  
 Golden State P. C. Co., Los Angeles, Cal.  
 Great Western P. C. Co., Kansas City, Mo.  
 Hawkeye P. C. Co., Des Moines, Iowa  
 Hercules Cement Corp., Philadelphia  
 Hermitage P. C. Co., Nashville, Tenn.  
 Huron P. C. Co., Detroit, Mich.  
 International Cement Corp., New York

International P. C. Co., Ltd., Spokane, Wash.  
 Kosmos P. C. Co., Louisville, Ky.  
 La. Tolteca Compania de Cemento Portland, Mexico City, Mex.

Lawrence Cement Co., New York  
 Lehigh P. C. Co., Allentown, Pa.  
 Louisville Cement Co., Louisville, Ky.  
 Manitowoc P. C. Co., Manitowoc, Wis.  
 Marlboro Cement Co., Edmonton, Can.  
 Marquette Cement Mfg. Co., Chicago  
 Medusa Portland Cement Co., Cleveland, O.  
 Missouri P. C. Co., St. Louis, Mo.  
 Monarch Cement Co., Humboldt, Kans.  
 Monolith P. C. Co., Los Angeles, Cal.  
 National Cement Co., Birmingham, Ala.  
 Nazareth Cement Co., Nazareth, Pa.  
 Nebraska Cement Co., Denver, Colo.  
 Newago P. C. Co., Newago, Mich.  
 New Egyptian P. C. Co., Detroit, Mich.  
 North Amer. Cement Corp., Albany, N. Y.  
 Northwestern States P. C. Co., Mason City, Ia.  
 Oklahoma P. C. Co., Denver, Colo.  
 Olympic P. C. Co., Ltd., Seattle, Wash.  
 Oregon P. C. Co., Portland, Ore.  
 Pacific P. C. Co., San Francisco, Calif.  
 Peerless P. C. Co., Detroit, Mich.  
 Peninsular P. C. Co., Cement City, Mich.  
 Penn-Allen Cement Co., Nazareth, Pa.  
 Pennsylvania-Dixie Cement Corp., New York  
 Petoskey P. C. Co., Petoskey, Mich.  
 Phoenix P. C. Co., Philadelphia  
 P. C. Co. of Utah, Salt Lake City, Utah  
 Pyramid P. C. Co., Des Moines, Iowa  
 Riverside P. C. Co., Los Angeles, Calif.  
 St. Marys Cement Co., Toronto, Can.  
 San Antonio P. C. Co., San Antonio, Texas  
 Santa Cruz P. C. Co., San Francisco, Calif.  
 Signal Mountain P. C. Co., Chattanooga, Tenn.  
 Southern States P. C. Co., Rockport, Ga.  
 Southwestern P. C. Co., Los Angeles, Cal.  
 Standard P. C. Co., Cleveland, Ohio  
 Sun P. C. Co., Portland, Ore.  
 Superior P. C. Co., Seattle, Wash.  
 Three Forks P. C. Co., Denver, Colo.  
 Tidewater P. C. Co., Baltimore, Md.  
 Trinity P. C. Co., Dallas, Tex.  
 Union P. C. Co., Denver, Colo.  
 U. S. P. C. Co., Denver, Colo.  
 Utah Idaho Cement Co., Ogden, Utah  
 Vulcanite P. C. Co., Philadelphia  
 Wabash P. C. Co., Detroit, Mich.  
 Warrior Cement Corp., Chattanooga, Tenn.  
 Wellston Iron Furnace Co., Jackson, Ohio  
 Wolverine P. C. Co., Coldwater, Mich.  
 Wyandotte P. C. Co., Detroit, Mich.

## Cement, Quick-Hardening

\*Universal Atlas Cement Co., Chicago (Alumina)  
 Glens Falls Cement Co., Glens Falls, N. Y.  
 (Portland)  
 International Cement Corp., New York (Portland)

## Cement Tools

Abrams Cement Tool Co., Detroit, Mich.

## Centrifugal Pumps (See Pumps)

## Chains, Block

\*Chain Belt Co., Milwaukee, Wis.  
 American Chain Co., Bridgeport, Conn.  
 Baldwin Chain & Mfg. Co., Worcester, Mass.  
 Columbus-McKinnon Chain Corp., Tonawanda, N. Y.  
 Diamond Chain & Mfg. Co., Indianapolis, Ind.  
 Jeffrey Mfg. Co., Columbus, Ohio  
 Link-Belt Co., Chicago  
 U. S. Chain & Forge Co., Pittsburgh, Pa.  
 Webster & Weller Mfg. Co's, Chicago

## Chains, Power Transmission

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
 \*Chain Belt Co., Milwaukee, Wis.  
 Dodge Mfg. Corp., Mishawaka, Ind.  
 Hais Mfg. Co., Geo., New York  
 Jeffrey Mfg. Co., Columbus, O.  
 Link-Belt Co., Chicago  
 Morse Chain Co., Ithaca, N. Y.  
 Stephens-Adamson Mfg. Co., Aurora, Ill.  
 Webster & Weller Mfg. Co's, Chicago  
 Whitney Mfg. Co., Hartford, Conn.

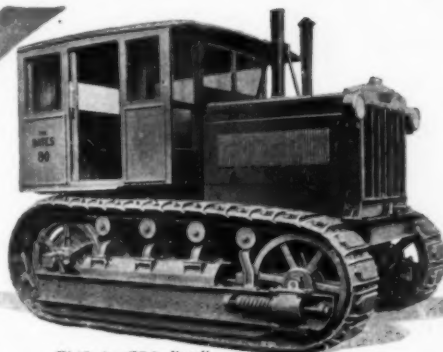
## Check Valves (See Valves)

## Chimneys, Concrete

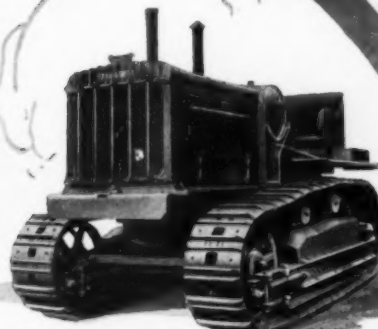
Heine Chimney Co., Chicago  
 Kellogg & Co., M. W., Jersey City, N. J.  
 Rust Engg. Co., Pittsburgh, Pa.  
 Weber Chimney Co., Chicago

## Chimneys, Radial Brick

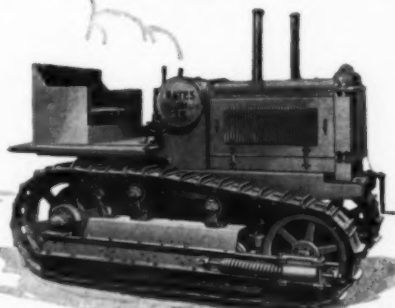
\*Northwestern Chimney Const. Co., Cleveland, O.  
 American Chimney Corp., New York  
 Continental Chimney Co. of Chicago, Chicago  
 Custodia Alphonse Chimney Const. Co., New York  
 Heine Chimney Co., Chicago  
 Heinicke, Inc., H. R., Indianapolis, Ind.  
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- \*Littleford Bros., Cincinnati, Ohio
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- Chattanooga Boiler & Tank Co., Chattanooga, Tenn.
- Chicago Bridge & Iron Wks., Chicago
- Edwards Mfg. Co., Cincinnati, Ohio
- Graver Tank & Mfg. Co., E. Chicago, Ind.
- Koven & Bro., L. O., Jersey City, N. J.
- Lancaster Iron Works, Lancaster, Pa.
- New York Central Iron Works, Inc., Hagerstown, Md.
- Petroleum Iron Works Co., Sharon, Pa.
- Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
- Tippett & Wood, Phillipsburg, N. J.

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- Cleveland Steel Tool Co., Cleveland, Ohio
- Dalzell Co., Philadelphia
- Verona Tool Works, Verona, Pa.

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- \*Wallace & Tiernan Co., Inc., Newark, N. J.
- Paradon Mfg. Co., Arlington, N. J.

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- Hooker Electrochemical Co., New York
- Mathieson Alkali Works, Inc., New York
- Pennsylvania Salt Mfg. Co., Philadelphia

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- \*Insley Mfg. Co., Indianapolis, Ind.
- \*Jaeger Machine Co., Columbus, Ohio
- \*Lakewood Engg. Co., Columbus, Ohio
- \*Ransome Conc. Machinery Co., Dunellen, N. J.
- Archer Iron Works, Chicago, Ill.

## Clamshell Buckets (See Buckets)

## Clamps and Ties, Form

- \*Insley Mfg. Co., Indianapolis, Ind.
- Batavia Clamp Co., Batavia, N. Y.
- Black Bros. Co., Mendota, Ill.
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- Concrete Form Tie Corp., Pittsburgh, Pa.
- Ezy-Set Wall Tie Co., Dayton, Ohio
- Kuhlman & Co., W. A., Toledo, Ohio
- M. & M. Wire Clamp Co., Minneapolis, Minn.
- Taylor Mfg. Co., James L., Poughkeepsie, N.Y.
- Universal Form Clamp Co., Chicago
- Wedgit Tie Co., Inc., New York

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- \*Insley Mfg. Co., Indianapolis, Ind.
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- Concrete Engg. Co., Omaha, Neb.
- Handy Mfg. Co., Chicago
- Kardong Bros., Inc., Minneapolis, Minn.
- M. & M. Wire Clamp Co., Minneapolis, Minn.
- O. D. G. Co., The, Owensboro, Ky.
- Red Star Prods. Corp., Cleveland, Ohio
- Ross Co., H. W., Cincinnati, Ohio
- Steelform Contracting Co., San Francisco, Calif.
- Sterling Wheelbarrow Co., Milwaukee, Wis.
- Symons Clamp & Mfg. Co., Chicago
- Taylor Mfg. Co., James L., Poughkeepsie, N.Y.
- Universal Form Clamp Co., Chicago

## Clay Pipe (See Pipe)

## Clips, Wire Rope

- \*American Steel & Wire Co., Chicago
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- Fischer & Hayes Rope & Steel Co., Chicago
- Hazard Wire Rope Co., Wilkes-Barre, Pa.
- Laughlin Co., The, Portland, Maine
- Lechen & Sons Rope Co., St. Louis
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- Mockbee Co., C. M., Cincinnati, Ohio
- Upson-Walton Co., Cleveland, Ohio
- Wilcox-Crittenden & Co., Inc., Middletown, Conn.

## Clutches

- \*Twin Disc Clutch Co., Racine, Wis.
- Beach Mfg. Co., Charlotte, Mich.
- Brown Clutch Co., Sandusky, Ohio
- Brown-Lipe Gear Co., Syracuse, N. Y.
- Link-Belt Co., Chicago
- Moore-Master Mfg. Co., Chicago
- O. K. Clutch & Machy. Co., Columbia, Pa.

## Cocks, Curb and Corporation

- Chapman Valve Mfg. Co., Indian Orchard, Mass.
- Glauber Brass. Mfg. Co., Cleveland, Ohio
- Haydenville Co., Haydenville, Mass.
- Hays Mfg. Co., Erie, Pa.
- Mueller Co., Decatur, Ill.
- Union Water Meter Co., Worcester, Mass.

## Column Clamps (See Clamps)

## Compounds, Sewer Joint

- \*Servicised Promoulded Products, Chicago
- \*Standard Oil Co. of Indiana, Chicago
- Atlas Mineral Products Co., Meritstown, Pa.
- Dixon Crucible Co., Jos., Jersey City, N. J.
- Leadite Co., The, Philadelphia
- Pacific Flush Tank Co., Chicago and New York
- Pressite Engg. Co., St. Louis, Mo.
- Ric-wil Co., Cleveland, Ohio
- Ruberoid Co., New York

## Compressors, Air, Portable

- \*Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- \*Domestic Eng. & Pump Co., Shippensburg, Pa.
- \*Homelite Corp., Port Chester, N. Y.
- \*Independent Pneu. Tool Co., Chicago
- \*Metalweld, Inc., Philadelphia
- \*National Brake & Elec. Co., Milwaukee, Wis.
- \*Novo Engine Co., Lansing, Mich.
- \*Schramm, Inc., West Chester, Pa.
- \*Sterling Machy. Corp., Kansas City, Mo.
- Acme Rd. Machy. Co., Frankfort, N. Y.
- Buhl Co., Chicago, Ill.
- Chicago Pneumatic Tool Co., New York
- Curtis Pneumatic Machy. Co., St. Louis, Mo.
- Davey Compressor Co., Kent, Ohio
- Gardner-Denver Co., Quincy, Ill.
- Ingersoll-Rand Co., New York
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- Pennsylvania Pump & Comp. Co., Easton, Pa.
- Sullivan Machinery Co., Chicago
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- \*National Brake & Elec. Co., Milwaukee, Wis.
- \*Novo Engine Co., Lansing, Mich.
- \*Schramm, Inc., West Chester, Pa.
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- Chicago Pneumatic Tool Co., New York
- Cooper-Bessemer Corp., Mt. Vernon, Ohio
- Curtis Pneumatic Machy. Co., St. Louis, Mo.
- DeLaval Steam Turbine Co., Trenton, N. J.
- Fairbanks, Morse & Co., Chicago
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- Worthington Pump & Machy. Corp., New York
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## Concrete Breakers (See Tools, Pneumatic)

## Concrete Carts (See Carts)

## Concrete Block Machines (See Block Machines)

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## Concrete Chutes (See Chutes)

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## Concrete Manhole Forms (See Forms)

## Concrete Mixer Bodies (See Bodies)

## Concrete Mixers (See Mixers)

## Concrete Pavers (See Pavers)

## Concrete Piles (See Piles)

## Concrete Pipe (See Pipe)

## Concrete Pipe Forms (See Forms)

## Concrete Placers, Pneumatic (See Placers)

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- \*Lakewood Engg. Co., Columbus, Ohio
- \*Ransome Conc. Machinery Co., Dunellen, N. J.
- Archer Iron Works, Chicago

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## Concrete Road Finishers (See Finishers)

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- Ric-wil Co., Cleveland, Ohio
- Wyckoff Pipe & Cressoting Co., New York

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- \*Austin-Western Rd. Machy. Co., Chicago
- \*Chain Belt Co., Milwaukee, Wis.
- \*Good Roads Machy. Co., Kennett Sq., Pa.
- \*Pioneer Gravel Equip. Mfg. Co., Minneapolis
- Atlas Engg. Co., Clintonville, Wis.
- Barber-Greene Co., Aurora, Ill.
- Bartlett & Snow Corp., C. O., Cleveland, O.
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- Fairfield Engg. Co., Marion, Ohio
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- Fairfield Engg. Co., Marion, Ohio
- Gifford-Wood Co., Hudson, N. Y.
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- Iowa Mfg. Co., Cedar Rapids, Iowa
- Industrial Brownhoist Corp., Cleveland, Ohio
- Jeffrey Mfg. Co., Columbus, Ohio
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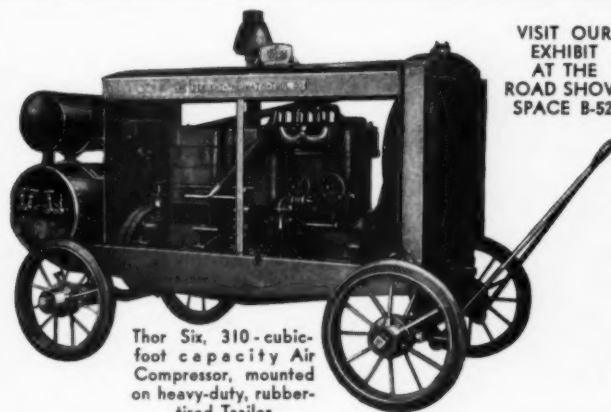
- Lamson Co., Syracuse, N. Y.
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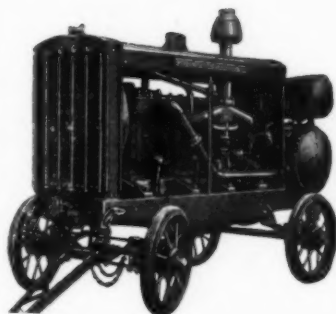
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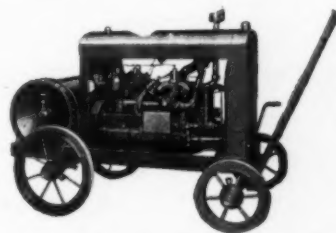
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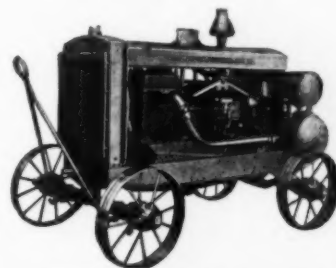
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- Industrial Brownhoist Corp., Cleveland, Ohio
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- Harnischfeger Corp., Milwaukee, Wis.
- Mead-Morrison Mfg. Co., Boston, Mass.
- Orton Crane & Shovel Co., Chicago
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- Galion Iron Wks. & Mfg. Co., Galion, Ohio
- Iowa Mfg. Co., Cedar Rapids, Iowa
- Jeffrey Mfg. Co., Columbus, Ohio
- New England Road Machy. Co., S. Boston, Mass.
- Nordberg Mfg. Co., Milwaukee, Wis.
- Rogers Iron Wks. Co., Joplin, Mo.
- Russell Grader Mfg. Co., Minneapolis, Minn.
- Smith Engg. Works, Milwaukee, Wis.
- Sturtevant Mill Co., Boston, Mass.
- Traylor Engg. & Mfg. Co., Allentown, Pa.
- United Iron Works, Kansas City, Mo.
- Universal Crusher Co., Cedar Rapids, Iowa
- Universal Road Machy. Co., Kingston, N. Y.
- Western Wheeled Scraper Co., Aurora, Ill.
- Wheeling Mould & Fdy. Co., Wheeling, W. Va.
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- \*Diamond Iron Works, Minneapolis, Minn.
- \*Good Roads Machy. Co., Kennett Sq., Pa.
- \*Pioneer Gravel Equip. Mfg. Co., Minneapolis
- Acme Rd. Machy. Co., Frankfort, N. Y.
- Iowa Mfg. Co., Cedar Rapids, Iowa
- Smith Engg. Works, Milwaukee, Wis.
- Traylor Engg. & Mfg. Co., Allentown, Pa.
- Universal Road Machy. Co., Kingston, N. Y.
- Western Wheeled Scraper Co., Aurora, Ill.
- Williams Patent Crusher & Pulv. Co., St. Louis
- W-K-M Co., Houston, Texas

## Culvert Forms (See Forms)

## Culverts, Cast Iron (See also Pipe, Cast Iron)

- \*Burch Corp., The, Crestline, Ohio
- \*U. S. Pipe & Fdy. Co., Burlington, N. J.
- American Casting Co., Birmingham, Ala.
- Beach Mfg. Co., Charlotte, Mich.
- Galion Iron Works & Mfg. Co., Galion, Ohio

## Culverts, Corrugated Metal

- \*Armco Culvert Mfrs. Assn., Middletown, O.
- \*Austin-Western Road Machy. Co., Chicago
- \*Gohi Culv. Mfrs. Inc., Newport, Ky.
- \*Good Roads Machy. Co., Kennett Square, Pa.
- American Casting Co., Birmingham, Ala.
- Bark Riv. Bridge & Culv. Co., Bark Riv., Mich.
- Beach Mfg. Co., Charlotte, Mich.
- Beatrice Steel Tank Mfg. Co., Beatrice, Neb.
- Berger Mfg. Co., Jacksonville, Fla.
- Burnham Mfg. Co., Woods Creek, Utah
- Calif. Corr. Culv. Co., W. Berkeley, Calif.
- Canada Ingot Ir. Co., Ltd., Guelph, Ont.
- Canton Culv. & Silo Co., Canton, Ohio
- Denver Steel & Iron Wks., Denver, Colo.
- Dixie Culv. & Metal Co., Atlanta, Ga.
- Edwards Mfg. Co., Cincinnati, Ohio
- Galion Iron Wks. & Mfg. Co., Galion, Ohio
- Hardesty Mfg. Co., R., Denver, Colo.
- Iowa Pure Ir. Co., Des Moines, Iowa
- Kentucky Culv. Mfg. Co., Louisville, Ky.
- Lyle Culv. & Pipe Co., Minneapolis
- Maryland Culv. & Metal Co., Baltimore, Md.
- Nebraska Culv. & Mfg. Co., Wahoo, Neb.
- N. E. Metal Culv. Co., Palmer, Mass.
- Newport Culv. Co., Newport, Ky.
- Northfield Iron Co., Northfield, Minn.
- Northwestern Sheet & Ir. Wks., Wahpeton, N.D.
- Ohio Corr. Culv. Co., Middletown, Ohio
- O'Neill Co., W. Q., Crawfordville, Ind.
- Penn Metal Co., Boston, Mass.
- Pure Iron Culv. & Mfg. Co., Portland, Ore.
- Road Supply & Metal Co., Topeka, Kans.
- St. Paul Corr. Co., St. Paul, Minn.
- Sioux Falls Metal Culv. Co., Sioux Falls, S. D.
- So. Metal Culv. Co., Salisbury, N. C.
- Spokane Culv. & Tank Co., Spokane, Wash.
- Tennessee Metal Culv. Co., Nashville, Tenn.
- Toncan Culv. Mfrs. Assn., Massillon, Ohio
- Union Iron Prod. Co., E. Chicago, Ind.
- Western Metal Mfg. Co., Houston, Tex.
- Wheeling Corr. Co., Wheeling, W. Va.

## Curb and Gutter Forms (See Forms)

## Curb Cocks (See Cocks)

## Curb Guards, Steel (See Guards)

## Curing Concrete, Asphalt for (See Asphalt)

## Cutters, Bar (See Benders and Cutters)

## Cutters, Pipe

- \*Ellis & Ford Mfg. Co., Detroit, Mich.
- Armstrong Mfg. Co., Detroit, Mich.
- Barnes Tool Co., New Haven, Conn.
- Borden Co., Warren, Ohio
- Cook, Inc., A. D., Lawrenceburg, Ind.
- Erie Tool Works, Erie, Pa.
- Greenfield Tap & Die Corp., Greenfield, Mass.
- Oswego Tool Co., Oswego, N. Y.
- Reed Mfg. Co., Erie, Pa.
- Smith Mfg. Co., A. P., East Orange, N. J.
- Walworth Co., Boston, Mass.

## Cutters, Rod and Wire

- Carolina Mfg. Co., Sterling, Ill.
- Helwig Mfg. Co., St. Paul, Minn.
- M. & M. Wire Clamp Co., Minneapolis, Minn.
- Morse-Starrett Prod. Co., Oakland, Calif.

## Cutting and Welding Apparatus (See Welding Apparatus)

## Deep Well Pumps (See Pumps)

## Derrick Fittings (See Fittings)

## Derricks, Guy and Stiffleg

- \*Clyde Iron Wks. Sales Co., Duluth, Minn.
- \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- \*Lidgerwood Mfg. Co., Elizabeth, N. Y.
- \*McKiernan-Terry Corp., New York
- \*Mundy Hoisting Eng. Co., J. S., Newark, N. J.
- \*Sagson Derrick Co., Chicago
- \*Street Bros. Mach. Wks., Chattanooga, Tenn.
- American Hoist & Derrick Co., St. Paul, Minn.
- Flory Mfg. Co., Bangor, Pa.

## Derricks, Pipe-Laying

- \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- \*Sagson Derrick Co., Chicago
- \*Street Bros. Mach. Works, Chattanooga, Tenn.
- Taylor Port. Steel Der. Co., Chicago
- W-K-M Co., Houston, Texas

## Derricks, Revolving

- \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- \*Street Bros. Mach. Works, Chattanooga, Tenn.

## Derricks, Steel

- \*Clyde Iron Works Sales Co., Duluth, Minn.
- \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- \*Hayward Co., New York
- \*Insley Mfg. Co., Indianapolis, Ind.
- \*Lidgerwood Mfg. Co., Elizabeth, N. J.
- \*McKiernan-Terry Corp., New York
- \*Sagson Derrick Co., Chicago
- \*Street Bros. Mach. Works, Chattanooga, Tenn.
- American Hoist & Der. Co., St. Paul, Minn.

## Derricks, Steel, Portable

- \*Clyde Iron Wks. Sales Co., Duluth, Minn.
- \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- \*Lidgerwood Mfg. Co., Elizabeth, N. J.
- \*Street Bros. Mach. Works, Chattanooga, Tenn.
- American Hoist & Der. Co., St. Paul, Minn.
- Taylor Port. Steel Derrick Co., Chicago

## Diaphragm Pumps (See Pumps)

## Diesel Engines (See Engines)

## Diesel Shovels (See Shovels)

## Diggers, Post Hole, Power (See Augers)

## Dipper Dredges (See Dredges)

## Distributing Plants, Concrete (See Concrete Placing Plants)

## Distributors, Tar, Asphalt and Oil

- \*Austin-Western Road Machy. Co., Chicago
- \*Etnyre & Co., E. D., Oregon, Ill.
- \*Good Roads Machy. Co., Kennett Square, Pa.
- \*Hvass & Co., Chas., New York
- Honhorst Co., Jos., Cincinnati, Ohio
- Kinney Mfg. Co., Boston, Mass.
- Macled Co., Cincinnati, Ohio
- Municipal Supply Co., South Bend, Ind.
- Spears-Wells Machy. Co., Oakland, Calif.
- Universal Rd. Machy. Co., Kingston, N. Y.

## Ditchers (See Excavators, Trench; or Graders)

## Drag Scrapers (See Scrapers)

If you find any errors or omissions in this Where to Purchase list, please send corrections to CONTRACTORS AND ENGINEERS MONTHLY

## P I O N E E R



*Maximum  
capacities*

*at lowest  
costs*



Pioneer Duplex Screening, Crushing and Loading Plant owned by Schmidt & Hitchcock of Phoenix, Ariz., and operating at Piedra, Ariz. This plant produces large daily capacities. It has sand rejector. Plant screens, crushes, loads, and rejects sand, all in one operation.



Three views of No. 40 Pioneer Screening, Crushing and Loading Plant owned by New Bloomfield Special Road District, Fulton, Missouri.



Showing feeder conveyor leading to No. 40 Pioneer plant, with view of bucket elevator on the left.

Picture below shows same No. 40 plant with Pioneer 21-yard bin. The No. 40 Pioneer plant screens, crushes and loads in one operation. Capacity is 350 to 500 cubic yards in ten hours, depending on oversize.



There are 11 different sizes of Pioneer Screening, Crushing and Loading Plants; also draglines, conveyors, storage bins and screening equipment.

## Low Cost Roads

depend upon low cost gravel. Specification gravel enters into all types of roads from cement to all-gravel types. By using portable gravel equipment in roadside pits, required capacities of specified size may be obtained at lowest cost. The expense of shipping in gravel is eliminated. The portable equipment is then moved to the next job. Pioneer plants are built to stand the incessant vibration of screening and crushing. All vital movable parts are SKF bearing equipped. The best testimonial to Pioneer performance is the unqualified praise of Pioneer users everywhere. Let us refer you to a few.

See Pioneer Gravel Equipment Exhibit at St. Louis Road Show, Jan. 12 to 16, incl. Space No. AR8.

**Pioneer Gravel Equipment Mfg. Co.**

1515 Central Avenue

Minneapolis

Minnesota



# WHERE TO PURCHASE

## Drag Shovels (See Shovels, Convertible)

## Dragline Cableways (See Cableways)

## Dragline Scrapers (See Scrapers)

## Drags, Road

\*Austin-Western Road Machy. Co., Chicago  
 \*Foote Bros. Gear & Mach. Co., Chicago  
 \*General Wheelbarrow Co., Cleveland, Ohio  
 \*Harris Co., B. W. & Leo, Minneapolis, Minn.  
 Acme Road Machy. Co., Frankfort, N. Y.  
 Adams Co., J. D., Indianapolis, Ind.  
 American Steel Scraper Co., Sidney, Ohio  
 Beach Mfg. Co., Charlotte, Mich.  
 Deere & Co., Moline, Ill.  
 Gallion Iron Wks. & Mfg. Co., Gallion, Ohio  
 Miskin Scraper Works, Ucon, Idaho  
 Sluaser McLean Scraper Co., Sidney, Ohio  
 Spears-Wells Machy. Co., Oakland, Calif.  
 Toledo Wheelbarrow Co., Toledo, Ohio  
 Universal Road Machy. Co., Kingston, N. Y.  
 Western Wheelbarrow Co., Aurora, Ill.

## Drainage Equipment, Special

Killefer Mfg. Co., Los Angeles, Calif.

## Drainage Tile (See Tile)

## Drawing Inks (See Inks)

## Drawing Instruments and Supplies (See Instruments)

## Dredges, Dipper

\*Bay City Shovels, Inc., Bay City, Mich.  
 \*Osgood Co., Marion, Ohio  
 American Steel Dredge Co., Ft. Wayne, Ind.  
 Bucyrus-Erie Co., South Milwaukee, Wis.  
 Marion Steam Shovel Co., Marion, Ohio

## Dredges, Hydraulic

American Steel Dredge Co., Fort Wayne, Ind.  
 Bucyrus-Erie Co., South Milwaukee, Wis.  
 Ellicott Mach. Corp., Baltimore, Md.  
 Morris Machine Works, Baldwinville, N. Y.

## Dredging Buckets (See Buckets)

## Dredging Machinery (See also Pumps, Dredging)

\*Ladgerwood Mfg. Co., Elizabeth, N. J.  
 \*McKiernan-Terry Corp., New York  
 \*Mundy Holist, Eng. Co., J. S. Newark, N. J.  
 \*Street Bros. Mach. Wks., Chattanooga, Tenn.  
 Bucyrus-Erie Co., South Milwaukee, Wis.  
 Ellicott Mach. Corp., Baltimore, Md.  
 Thomas Elevator Co., Chicago

## Dredging Pumps (See Pumps)

## Dressing, Belt

Dixon Crucible Co., Jos. Jersey City, N. J.  
 Hotelling Mfg. Co., Philadelphia  
 Stephenson Mfg. Co., Albany, N. Y.  
 Tropical Paint & Oil Co., Cleveland, Ohio  
 U. S. Rubber Co., New York

## Drill Steel, Hollow (See Steel)

## Drill Steel Sharpeners (See Sharpeners)

## Drills, Blast Hole and Well

Armstrong Mfg. Co., Waterloo, Iowa  
 Keystone Driller Co., Beaver Falls, Pa.  
 Loomis Machine Co., Tiffin, Ohio  
 Sanderson Cyclone Drill Co., Orrville, Ohio  
 Star Drilling Machine Co., Akron, Ohio

## Drills, Core

\*McKiernan-Terry Corp., New York  
 Ingersoll-Rand Co., New York  
 Loomis Machine Co., Tiffin, Ohio  
 Sprague & Henwood, Inc., Scranton, Pa.  
 Sullivan Machy. Co., Chicago

## Drills, Electric

\*Independent Pneu. Tool Co., Chicago  
 Black & Decker Mfg. Co., Towson, Md.  
 Chicago Pneumatic Tool Co., New York  
 Cincinnati Electric Tool Co., Cincinnati, Ohio  
 Portable Power Tool Corp., Warsaw, Ind.  
 Ryerson & Son, Jos. T., Chicago  
 Speedway Mfg. Co., Cicero, Ill.  
 Syntro Co., Pittsburgh, Pa.  
 Van Dorn Elec. Tool Co., Towson, Md.  
 Wappat, Inc., Pittsburgh, Pa.  
 Wodack Elec. Tool Corp., Chicago

## Drills, Rock, Pneumatic

\*Hardsocg Wonder Drill Co., Ottumwa, Ia.  
 \*Independent Pneu. Tool Co., Chicago  
 Buhl Co., The, Chicago  
 Chicago Pneu. Tool Co., New York  
 Cleveland Pneu. Tool Co., Cleveland  
 Dallett Co., Philadelphia, Pa.  
 Gardner-Donver Co., Quincy, Ill.  
 Gilman Mfg. Co., E. Boston, Mass.

Helwig Mfg. Co., St. Paul, Minn.  
 Ingersoll-Rand Co., New York  
 Keller, Inc., W. H., Grand Haven, Mich.  
 Loomis Machine Co., Tiffin, Ohio  
 Sullivan Machy. Co., Chicago  
 Wood Drill Works, Paterson, N. J.

## Drivers, Pile (See Hammers)

## Dryers, Sand and Gravel

\*Chausse Oil Burner Co., Elkhart, Ind.  
 \*Honhorst Co., Jos., Cincinnati, Ohio  
 \*Littleford Bros., Cincinnati, Ohio  
 Aeroll Burner Co., West New York, N. J.  
 Bartlett & Snow Co., C. O., Cleveland, Ohio  
 Macleod Co., Cincinnati, Ohio  
 Merriman Asphalt Plant, Inc., Lima, Ohio

## Dump Bodies (See Bodies)

## Dump Wagons (See Wagons)

## Dynamite

Atlas Powder Co., Wilmington, Del.  
 Austin Powder Co., Cleveland, Ohio  
 Egyptian Powder Co., East Alton, Ill.  
 DuPont de Nemours & Co., E. I., Wilmington, Del.  
 Equitable Powder Mfg. Co., East Alton, Ill.  
 Giant Powder Co., San Francisco, Calif.  
 Hercules Powder Co., Wilmington, Del.  
 Illinois Powder Mfg. Co., St. Louis, Mo.  
 King Powder Co., Cincinnati, Ohio

## Electric Cable (See Wire and Cable, Electric)

## Electric Drills (See Drills)

## Electric Hoists (See Hoists)

## Electric Lighting Plants

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
 \*Homelite Corp., Port Chester, N. Y.  
 \*Novo Engine Co., Lansing, Mich.  
 \*United States Motors Corp., Oshkosh, Wis.  
 Climax Engg. Co., Clinton, Iowa  
 Cook Motor Co., Delaware, Ohio  
 Cushman Motor Works, Lincoln, Neb.  
 Fairbanks, Morse & Co., Chicago  
 Fuller & Johnson Mfg. Co., Madison, Wis.  
 General Electric Co., Schenectady, N. Y.  
 Kohler Co., Kohler, Wis.  
 Sullivan Machy. Co., Chicago  
 Sunbeam Elec. Mfg. Co., Evansville, Ind.  
 Westinghouse E. & M. Co., E. Pittsburgh

## Electric Planes (See Planes)

## Electric Shovels (See Shovels)

## Electric Transformers (See Transformers)

## Electric Welding Apparatus (See Welding Apparatus)

## Elevators, Bucket

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
 \*Austin-Western Ed. Machy. Co., Chicago  
 \*Chain Belt Co., Milwaukee, Wis.  
 \*Good Roads Machy. Co., Kennett Square, Pa.  
 \*Pioneer Gravel Equip. Mfg. Co., Minneapolis  
 Chicago Automatic Conv. Co., Cicero, Ill.  
 Fairfield Engg. Co., Marion, Ohio  
 Haiss Mfg. Co., Geo., New York  
 Iowa Mfg. Co., Cedar Rapids, Iowa  
 Jeffrey Mfg. Co., Columbus, Ohio  
 Link-Belt Co., Chicago  
 Logan Co., Louisville, Ky.  
 New England Rd. Machy. Co., South Boston  
 New Holland Mach. Co., New Holland, Mich.  
 Rogers Iron Works Co., Joplin, Mo.  
 Smith Engg. Works, Milwaukee, Wis.  
 Stephens-Adamson Mfg. Co., Aurora, Ill.  
 Traylor Engg. & Mfg. Co., Allentown, Pa.  
 Universal Road Machy. Co., Kingston, N. Y.  
 Webster & Weller Mfg. Co., Chicago  
 Western Wheelbarrow Co., Aurora, Ill.

## Elevators, Material

\*C. H. & E. Mfg. Co., Milwaukee, Wis.  
 \*Chain Belt Co., Milwaukee, Wis.  
 \*Clyde Iron Wks. Sales Co., Duluth, Minn.  
 \*Insley Mfg. Co., Indianapolis, Ind.  
 \*Jaeger Machine Co., Columbus, Ohio  
 \*Lakewood Engg. Co., Columbus, Ohio  
 \*Sasgen Derrick Co., Chicago  
 O. K. Clutch & Machy. Co., Columbia, Pa.  
 Thomas Elevator Co., Chicago

## Embankment Rollers (See Rollers)

## Emulsified Asphalt (See Asphalt, Emulsified)

## Engineers, Consulting and Inspection (See Directory in this issue)

## Engines, Diesel

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
 \*Stover Mfg. & Eng. Co., Freeport, Ill.  
 \*Waukesha Motor Co., Waukesha, Wis.

Anderson Eng. & Fdy. Co., Anderson, Ind.  
 Atlas Imperial Diesel Eng. Co., Oakland, Calif.  
 Bethlehem Steel Co., Bethlehem, Pa.  
 Buckeye Machy. Co., Lima, Ohio  
 Buda Co., Harvey, Ill.  
 Busch-Sulzer Bros.-Diesel Eng. Co., St. Louis  
 Charter Gas Eng. Co., Sterling, Ill.  
 Chicago Pneu. Tool Co., New York  
 Cooper-Bessmer Corp., Mt. Vernon, Ohio  
 Cummins Engine Co., Columbus, Indiana  
 Fairbanks, Morse & Co., Chicago  
 Fulton Iron Works Co., St. Louis, Mo.  
 Johnson Mfg. Co., Seattle, Wash.  
 Ingersoll-Rand Co., New York  
 Lombard Governor Co., Ashland, Mass.  
 McIntosh & Seymour Corp., Auburn, N. Y.  
 Morris & DeLaVergne, Inc., I. P., Philadelphia  
 Muncie Oil Engine Co., Muncie, Ind.  
 New London Ship & Eng. Co., Groton, Ct.  
 Nordberg Mfg. Co., Milwaukee, Wis.  
 Power Mfg. Co., Marion, Ohio  
 St. Mary's Oil Eng. Co., St. Charles, Mo.  
 Worthington Pump & Machy. Corp., New York  
 Young Radiator Co., Racine, Wis.

## Engines, Gasoline

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
 \*Caterpillar Tractor Co., Peoria, Ill.  
 \*Continental Motors Corp., Muskegon, Mich.  
 \*Domestic Eng. & Pump Co., Shippensburg, Pa.  
 \*Electric Wheel Co., Quincy, Ill.  
 \*Hercules Motors Corp., Canton, Ohio  
 \*International Harv., Oshkosh, Wis.  
 \*Lansing Corp., New Holstein, Wis.  
 \*LeRoi Co., Milwaukee, Wis.  
 \*Novo Engine Co., Lansing, Mich.  
 \*Stover Mfg. & Eng. Co., Freeport, Ill.  
 \*Waukesha Motor Co., Waukesha, Wis.  
 Autocar Co., Ardmore, Pa.  
 Beaver Mfg. Co., Milwaukee, Wis.  
 Buda Co., Harvey, Ill.  
 Charter Gas Eng. Co., Harvey, Ill.  
 Climax Engg. Co., Clinton, Iowa  
 Cook Motor Co., Delaware, Ohio  
 Cushman Motor Works, Lincoln, Neb.  
 Evinrude Div., Outboard Motors Corp., Milwaukee  
 Foos Gas Engine Co., Springfield, Ohio  
 Fuller & Johnson Mfg. Co., Madison, Wis.  
 Hercules Products, Inc., Evansville, Ind.  
 Indian Motorcycle Co., Springfield, Mass.  
 Ingersoll-Rand Co., New York  
 Sterling Engine Co., Buffalo, N. Y.  
 Universal Motor Co., Oshkosh, Wis.  
 Universal Road Machy. Co., Kingston, N. Y.  
 Wisconsin Motor Co., Milwaukee, Wis.  
 Witte Engine Works, Kansas City, Mo.

## Engines, Hoisting (See Hoists)

## Engines, Kerosene

\*Electric Wheel Co., Quincy, Ill.  
 \*Hercules Motors Corp., Canton, Ohio  
 \*Stover Mfg. & Eng. Co., Freeport, Ill.  
 Climax Engg. Co., Clinton, Iowa  
 Fuller & Johnson Mfg. Co., Madison, Wis.  
 Hercules Products, Inc., Evansville, Ind.  
 Witte Engine Works, Kansas City, Mo.

## Excavators, Bucket-Loading

Barber-Greene Co., Aurora, Ill.  
 Haiss Mfg. Co., Inc., Geo., New York  
 New England Rd. Machy. Co., S. Boston, Mass.  
 Spears-Wells Machy. Co., Oakland, Calif.

## Excavators, Dragline

\*Bay City Shovels, Inc., Bay City, Mich.  
 \*General Excavator Co., Marion, Ohio  
 \*Insley Mfg. Co., Indianapolis, Ind.  
 \*Koehring Co., Milwaukee, Wis.  
 \*Osgood Co., Marion, Ohio  
 \*Manitowoc Engg. Works, Manitowoc, Wis.  
 \*Speeder Machy. Corp., Cedar Rapids, Iowa  
 American Hoist & Derrick Co., St. Paul  
 Buckeye Traction Ditcher Co., Findlay, O.  
 Bucyrus-Erie Co., Milwaukee, Wis.  
 Byers Machine Co., Ravenna, Ohio  
 Harnischfeger Corp., Milwaukee, Wis.  
 Industrial Brownhoist Corp., Cleveland, O.  
 Marion Steam Shovel Co., Marion, Ohio  
 Mead-Morrison Mfg. Co., Boston, Mass.  
 Monaghan Mfg. Corp., Chicago  
 Northwest Engg. Co., Chicago  
 Ohio Power Shovel Co., Lima, Ohio  
 Orton Crane & Shovel Co., Chicago  
 Pace Engg. Co., Chicago  
 Star Drilling Machine Co., Akron, Ohio  
 Thew Shovel Co., Lorain, Ohio

## Excavators, Trench, Bucket and Wheel-Type

\*Parsons Co., Newton, Iowa  
 Buckeye Traction Ditcher Co., Findlay, O.  
 Cleveland Trencher Co., Cleveland, Ohio  
 Industrial Brownhoist Corp., Cleveland, O.

## Expansion Joint Material, Paving

\*Carey Co., Philip, Cincinnati, Ohio  
 \*Servicised Premoulded Products, Chicago  
 \*Standard Oil Co. of Ind., Chicago

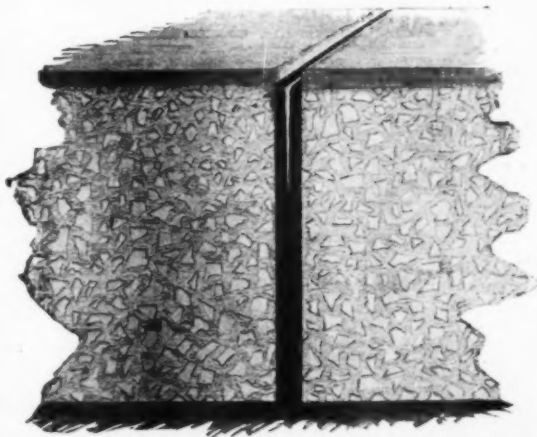
\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover \*



# BETTER EXPANSION JOINTS

## BASE FILL OF THE PERFECT POURED JOINT

The cross-section view at the left shows a joint or crevice base fill with—cold poured—SERVICISED LIQUID RUBBER ASPHALT—a tough elastic filling—non-oozing in nature, which sets to a leathery mass.



## THE PERFECT POURED JOINT

The cross-section view to the right shows the Perfect Poured joint or crevice fill—note the top finish filler—

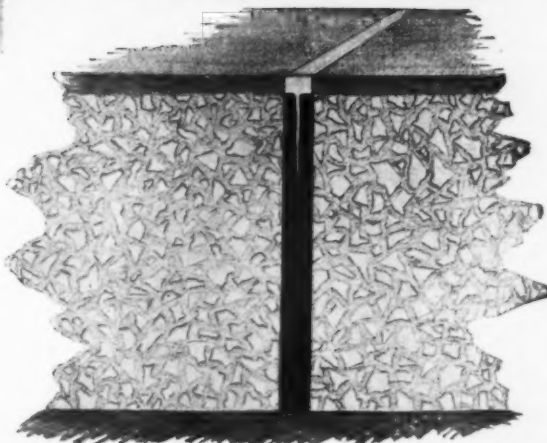
### SERVICISED GRAY FILLER

poured cold or hot from emulsified or solid form as desired—removes the unsightly black lines from paving and makes a better expansion joint. Write for full particulars.

## OTHER SERVICISED PRODUCTS

Asphalt Planks  
Rail Filler  
Asphalt Tile  
Rubber Block

Expansion Joints  
Asphalt Emulsions  
Colored Emulsions  
Cable Trunking



**SERVICISED**  
REG. U. S. PAT. OFF. © 1918  
Chicago  
53 W. Jackson Blvd.

**PREMOULDED PRODUCTS, INC.**

GENERAL DISTRIBUTORS For Products Manufactured By  
**SERVICISED PRODUCTS CORPORATION**

Factories and Sales Offices  
Sandusky, Ohio  
1st and Sandusky St.

Wilmington, Del.  
Church & F St.

DISTRIBUTORS and DEALERS IN PRINCIPAL TRADING CENTERS

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

# WHERE TO PURCHASE

## Expansion Joint Material, Paving (Cont.)

Johns-Manville Corp., New York  
Kalsman Steel Co., Chicago  
Meadows, Inc., W. R., Elgin, Ill.  
Ohio Fibrated Asphalt & Rubber Co., Chicago  
St. Paul Corrugating Co., St. Paul, Minn.  
Truscon Steel Co., Youngstown, Ohio  
Western Elastite Roofing Co., Denver, Colo.

## Explosives (See Dynamite or Powder, Black)

## Explosives Storage (See Magazines)

## Fabric Reinforcing for Concrete (See Wire Fabric Reinforcing)

## Fence, Snow

\*Good Roads Machy. Co., Kennett Square, Pa.  
Illinois Wire & Mfg. Co., Joliet, Ill.  
New Jersey Fence Co., Burlington, N. J.  
Northfield Iron Co., Northfield, Minn.  
Rowe Mfg. Co., Galesburg, Ill.  
Wickwire-Spencer Steel Co., New York

## Fence, Wire and Iron

\*American Steel & Wire Co., Chicago  
American Fence Const. Co., New York  
Anchor Post Fence Co., Chicago  
Bethlehem Steel Co., Bethlehem, Pa.  
Chain Link Fence Co., Chicago  
Continental Steel Corp., Kokomo, Ind.  
Cyclone Fence Co., Waukegan, Ill.  
Edwards Mfg. Co., Cincinnati, Ohio  
Giant Mfg. Co., Council Bluffs, Iowa  
Indiana Steel & Wire Co., Muncie, Ind.  
Interlocking Fence Co., Morton, Ill.  
Keystone Steel & Wire Co., Peoria, Ill.  
Page Steel & Wire Co., New York  
Pittsburgh Steel Co., Pittsburgh, Pa.  
Stewart Iron Works Co., Cincinnati, Ohio  
Van Dorn Iron Works, Cleveland, Ohio  
Wayne Iron Works, Wayne, Pa.  
Wickwire-Spencer Steel Co., New York

## Finishers, Asphalt Road

\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Lakewood Engg. Co., Cleveland, Ohio

## Finishers, Concrete Road

\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Heltzel Steel Form & Iron Co., Warren, Ohio  
\*Lakewood Engg. Co., Cleveland, Ohio

## Finishing Machines, Shoulder

\*Moritz-Bennett Corp., Effingham, Ill.

## Fittings, Derrick

\*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.  
\*Hayward Co., New York  
\*Lidgerwood Mfg. Co., Elizabeth, N. J.  
\*Mandy Hoisting Eng. Co., J. S., Newark, N. J.  
\*Sageen Derrick Co., Chicago  
\*Street Bros. Mach. Works, Chattanooga, Tenn.  
American Hoist & Der. Co., St. Paul, Minn.  
Flory Mfg. Co., S., Bangor, Pa.

## Fittings, Pipe

\*Central Foundry Co., New York  
\*U. S. Pipe & Fdy. Co., Burlington, N. J.  
American Cast Iron Pipe Co., Birmingham, Ala.  
Builders Iron Fdy., Providence, R. I.  
Clow & Sons, J. B., Chicago  
Crane Co., Chicago  
Donaldson Iron Co., Emaus, Pa.  
Kennedy Valve Mfg. Co., Elmira, N. Y.  
Lunkenheimer Co., Cincinnati, Ohio  
Nat. O. I. Pipe Co., Birmingham, Ala.  
Reading Steel Cast. Co., Inc., Bridgeport, Ct.  
Walworth Co., Boston, Mass.  
Warren Fdy. & Pipe Co., New York  
Westinghouse E. & M. Co., E. Pittsburgh, Pa.  
Wood & Co., R. D., Philadelphia

## Fittings, Wire Rope

\*American Steel & Wire Co., Chicago  
\*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.  
\*Williamsport Wire Rope Co., Williamsport, Pa.  
Broderick & Bassom Rope Co., St. Louis  
Green, L. F., Chicago  
Leschen & Sons Rope Co., A., St. Louis  
Roebeling's Sons Co., John A., Trenton, N. J.  
Upson-Walton Co., Cleveland, Ohio  
Wilcox-Crittenden Co., Inc., Middletown, Ct.

## Floodlights, Acetylene, Portable

\*National Carbide Sales Co., New York  
Macleod Co., Cincinnati, Ohio  
Milburn Co., Alexander, Baltimore, Md.  
Oxweld Acetylene Co., New York

## Floodlights, Electric, Portable

\*Homelite Corp., Port Chester, N. Y.  
Crouse-Hinds Co., Syracuse, N. Y.  
General Electric Co., Schenectady, N. Y.  
Kohler Co., Kohler, Wis.

## Floodlights, Stationary

B.B.T. Corp., Philadelphia  
Crouse-Hinds Co., Syracuse, N. Y.  
General Electric Co., Schenectady, N. Y.  
Giant Mfg. Co., Council Bluffs, Iowa  
Westinghouse E. & M. Co., E. Pittsburgh, Pa.

## Flooring, Bridge, Asphalt

\*Servicised Premuloid Products, Chicago  
Headley Emulsified Prod. Co., Philadelphia  
Johns-Manville Co., New York  
Meadows, Inc., W. R., Elgin, Ill.

## Forges, Oil

Hauck Mfg. Co., Brooklyn, N. Y.

## Form Clamps and Ties (See Clamps and Ties, Form)

## Forms, Concrete Culvert

\*Blaw-Knox Co., Pittsburgh, Pa.  
Concrete Form Co., Inc., Syracuse, N. Y.  
Northfield Iron Co., Northfield, Minn.

## Forms, Concrete Manhole

\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Heltzel Steel Form & Iron Co., Warren, O.  
Hotchkiss Steel Prod. Co., Binghamton, N. Y.  
Metal Forms Corp., Milwaukee, Wis.

## Forms, Concrete Pipe

\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Heltzel Steel Form & Iron Co., Warren, O.  
Climax Machy. Co., Indianapolis, Ind.  
Marion Iron Works, Los Angeles, Calif.  
Quinn Wire & Iron Wks., Boone, Iowa  
R. & L. Concrete Machy. Co., Kendallville, Ind.

## Forms, Concrete Road

\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Heltzel Steel Form & Iron Co., Warren, Ohio  
\*Lakewood Engg. Co., Columbus, Ohio  
Harm Co., George O., Warren, Ohio  
Hotchkiss Steel Prods. Co., Binghamton, N. Y.  
Metal Forms Corp., Milwaukee, Wis.  
Truscon Steel Co., Youngstown, Ohio

## Forms, Curb and Gutter

\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Heltzel Steel Form & Iron Co., Warren, O.  
\*Littleford Bros., Cincinnati, Ohio  
Hotchkiss Steel Prods. Co., Binghamton, N. Y.  
Metal Forms Corp., Milwaukee, Wis.  
Truscon Steel Co., Youngstown, Ohio

## Forms, Sidewalk

\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Heltzel Steel Form & Iron Co., Warren, Ohio  
Hotchkiss Steel Prods. Co., Binghamton, N. Y.  
Metal Forms Corp., Milwaukee, Wis.

## Fresnos (See Scrapers, Rotary)

## Furnaces, Lead Melting

\*Chausse Oil Burner Co., Elkhart, Ind.  
\*Littleford Bros., Cincinnati, Ohio  
Aeroll Burner Co., West New York, N. J.  
Chicago Flexible Shaft Co., Chicago  
Hauck Mfg. Co., Brooklyn, N. Y.  
Macleod Co., Cincinnati, Ohio  
Smith Mfg. Co., A. P., East Orange, N. J.  
Stuebner Iron Works, Inc., G. L., Long Island City, N. Y.

## Gasoline Engines (See Engines)

## Gasoline Hoists (See Hoists)

## Gasoline Shovels (See Shovels)

## Gasoline Storage Tanks (See Tanks)

## Gates, Bin

\*Austin-Western Rd. Machinery Co., Chicago  
\*Butler Bin Co., Waukegan, Wis.  
\*Chain Belt Co., Milwaukee, Wis.  
\*Good Roads Machy. Co., Kennett Square, Pa.  
\*Insley Mfg. Co., Indianapolis, Ind.  
\*Lakewood Engg. Co., Columbus, Ohio  
\*Ransome Conc. Machy. Co., Dunellen, N. J.  
Beaumont Co., R. H., Philadelphia  
Haisa Mfg. Co., Geo., New York  
Neff & Fry Co., Camden, Ohio  
New Holland Machine Co., New Holland, Pa.  
Robins Conv. Belt Co., New York  
Smith Engg. Works, Milwaukee, Wis.  
Troyer Engg. & Mfg. Co., Allentown, Pa.  
Universal Road Machy. Co., Kingston, N. Y.  
Webster & Weller Mfg. Co's, Chicago

## Generators (See Motors and Generators)

## Giants, Hydraulic

Abendroth & Root Mfg. Co., New York  
Henry Iron Works, Joshua, San Francisco  
Johnson Mfg. Co., Seattle, Wash.

## Grader Blades (See Blades)

## Graders, Road

\*Austin-Western Rd. Machy. Co., Chicago  
\*Baker Mfg. Co., Springfield, Ill.  
\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Caterpillar Tractor Co., Peoria, Ill.  
\*Foote Bros. Gear & Mach. Co., Frankfort, N. Y.  
Acme Road Machy. Co., Indianapolis, Ind.  
Adams Co., J. D., Indianapolis, Ind.  
Beach Mfg. Co., Charlotte, Mich.  
Gallion Iron Wks. & Mfg. Co., Gallion, O.  
Ryan Mfg. Co., Chicago  
Spears-Wells Machy. Co., Oakland, Calif.  
Stroud Rd. Machy. Co., Omaha, Neb.  
Western Wheeled Scraper Co., Aurora, Ill.

## Graders, Road, Power

\*Caterpillar Tractor Co., Peoria, Ill.  
\*Good Roads Machy. Co., Kennett Square, Pa.  
\*Riddell Co., W. A., Bucyrus, Ohio  
Adams Co., J. D., Indianapolis, Ind.  
Beach Mfg. Co., Charlotte, Mich.  
Gallion Iron Wks. & Mfg. Co., Gallion, Ohio  
Spears-Wells Machy. Co., Oakland, Calif.  
Wehr Co., Milwaukee, Wis.  
Western Wheeled Scraper Co., Aurora, Ill.

## Graders, Road, Trench, Form

Carr & Co., Ted, Chicago

## Granite Block Paving (See Block Paving)

## Grating, Steel

\*Blaw-Knox Co., Pittsburgh, Pa.  
Hendrick Mfg. Co., Carbondale, Pa.

## Gravel Dryers (See Dryers)

## Gravel Washers (See Washers)

## Gravity Conveyors (See Conveyors)

## Grease (See Lubricants)

## Grizzlies (See also Crushers, Rock)

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
Bartlett & Snow Co., G. O., Cleveland, O.  
Link-Belt Co., Chicago  
Robins Conv. Belt Co., New York  
Rogers Iron Wks. Co., Joplin, Mo.  
Smith Engg. Works, Milwaukee, Wis.  
Stephens-Adamson Mfg. Co., Aurora, Ill.  
Traylor Engg. & Mfg. Co., Allentown, Pa.  
Webster & Weller Mfg. Co's, Chicago

## Grouting Machines

\*Ransome Conc. Machy. Co., Dunellen, N. J.

## Guard Rail, Highway

\*American Steel & Wire Co., Chicago  
Anchor Post Fence Co., New York  
Chain Belt Co., Milwaukee, Wis.  
Chain Link Fence Co., Chicago  
Cyclone Fence Co., Waukegan, Ill.  
Hazard Wire Rope Co., Wilkes-Barre, Pa.  
Page Steel & Wire Co., New York  
Stewart Iron Works Co., Cincinnati, Ohio  
Upson-Walton Co., Cleveland, Ohio  
Wickwire-Spencer Steel Co., New York

## Guards, Paving, Steel

Godwin Co., W. S., Baltimore, Md.

## Guards, Steel, for Curbs

Concrete Steel Co., New York  
Godwin Co., W. S., Baltimore, Md.  
Truscon Steel Co., Youngstown, Ohio

## Guy Derricks (See Derricks)

## Hammers, Pile, Drop

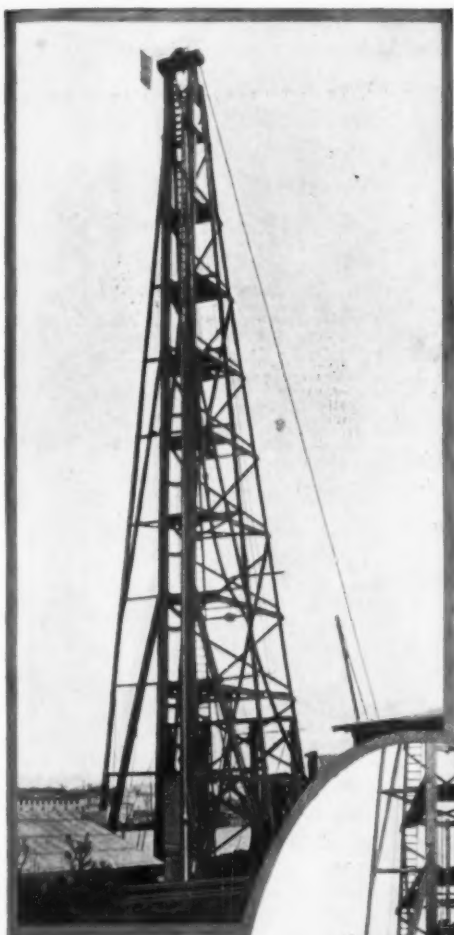
\*Clyde Iron Works Sales Co., Duluth, Minn.  
\*Dobbie Foundry & Mach. Co., Niagara Falls, N. Y.  
Vulcan Iron Works, Chicago

## Hammers, Sheeting, Hand, Power

\*McKiernan-Terry Corp., New York  
Chicago Pneumatic Tool Co., New York  
Union Iron Works, Hoboken, N. J.  
Ingersoll-Rand Co., New York

## Hammers, Sheeting and Pile, Power

\*McKiernan-Terry Corp., New York  
Union Iron Works, Hoboken, N. J.  
Vulcan Iron Works, Chicago



Pacific Bridge Co.,  
Portland, Oregon.  
Personnel: Mr. C.  
F. Swigert, Pres-  
ident; Mr. Philip  
Hart, Mgr.; Mr.  
F. W. Crocker,  
Chief Engineer;  
Mr. T. Graham,  
Gen'l Supt.; Mr.  
Geo. Welfer,  
Master Mechanic.



*"The Success of the pile driving  
—for Lake Union Bridge,  
Seattle, Washington  
will determine the outcome  
of the job"*

So wrote Mr. F. W. Crocker, Chief Engineer, Pacific Bridge Co., builders of this \$3,500,000 structure across Lake Union (Mr. Jack Graham, Gen. Supt.).

## McKiernan-Terry Hammers were selected

**T**HEY have driven 684—50-ft. piles to an average penetration of 35 ft. with an average submergence of 50 ft. and driven several hundred more in a pier of 115 to 120-ft. length piles, in which there will ultimately be 828 piles, with a submergence of 50 ft. They have another pier where they have to drive 240—35-ft. piles with an average submergence of the hammer of 10 ft. and the material is hardpan, clay and boulders. In addition to this they have driven, or will have driven, 260 pieces of 72-ft. length steel sheeting, and 285 pieces of 70-ft. steel. Of course, this piling was not all driven with the No. 11-B-2 Hammer, some of it having been driven with their old No. 11-B Hammers. This notable job *will be a success* as regards the pile driving—for the McKiernan-Terry Hammers *always* come through with colors flying!

**McKiernan-Terry Corporation**  
19 Park Row, New York City

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**NATIONAL HOISTS - STEELE & CONDUCT BRIDGE MACHINERY**  
**McKIERNAN-TERRY** **DOUBLE ACTING**  
**PILE HAMMERS**

Please mention the CONTRACTORS AND ENGINEERS MONTHLY—it helps.



# WHERE TO PURCHASE

## Hand Brooms (See Brooms)

## Hand Hoists (See Hoists)

## Heating Kettles (See Kettles)

## Heating Torches (See Torches)

## Heaters, Surface, Asphalt

- \*Chausse Oil Burner Co., Elkhart, Ind.
- \*Littleford Bros., Cincinnati, Ohio
- Aeroli Burner Co., West New York, N. J.
- Barber Asphalt Co., Philadelphia
- Equitable Asph. Maint. Co., Kansas City, Mo.
- Hauck Mfg. Co., Brooklyn, N. Y.
- Macleod Co., Cincinnati, Ohio
- Western Wheeled Scraper Co., Aurora, Ill.

## Highway Guard Rail (See Guard-Rail)

## Hitches, Tractor

- \*International Harv. Co., Chicago, Ill.
- \*Schaefer Co., Gustav, Cleveland, Ohio
- \*Trackson Co., Milwaukee, Wis.
- Davenport Mfg. Co., Los Angeles, Calif.
- Deere & Co., Moline, Ill.
- Eberhard Mfg. Co., Cleveland, Ohio
- Trail-IT Co., St. Paul, Minn.
- Troy Trailer & Wagon Co., Troy, Ohio
- Western Wheeled Scraper Co., Aurora, Ill.
- Whitehead & Kales Co., Detroit, Mich.

## Hoist Buckets (See Buckets)

## Hoists, Belt-Driven

- \*Clyde Iron Wks. Sales Co., Duluth, Minn.
- \*Davis, Inc., Norris K., San Francisco, Calif.
- \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- \*Domestic Eng. & Pump Co., Shippensburg, Pa.
- \*Lansing Co., Lansing, Mich.
- \*Lidgerwood Mfg. Co., Elizabeth, N. J.
- \*Mundy Htg. Eng. Co., J. S., Newark, N. J.
- \*Sterling Machy. Corp., Kansas City, Mo.
- \*Street Bros. Mach. Works, Chattanooga, Tenn.
- Acme Road Machy. Co., Frankfort, N. Y.
- American Hoist & Derrick Co., St. Paul
- Brown Clutch Co., Sandusky, Ohio
- Flory Mfg. Co., S., Bangor, Pa.
- Fridy Hoist & Machy. Co., Mountville, Pa.
- Link-Belt Co., Chicago
- Mead-Morrison Mfg. Co., Boston, Mass.
- Rogers Iron Wks. Co., Joplin, Mo.
- Universal Hoist & Mfg. Co., Cedar Falls, Ia.
- Williams Hoist Co., Los Angeles, Calif.

## Hoists, Concrete Tower and Material

- \*C. H. & E. Mfg. Co., Milwaukee, Wis.
- \*Clyde Iron Wks. Sales Co., Duluth, Minn.
- \*Davis, Inc., Norris K., San Francisco, Calif.
- \*Domestic Eng. & Pump Co., Shippensburg, Pa.
- \*Jaeger Machine Co., Columbus, Ohio
- \*Lidgerwood Mfg. Co., Elizabeth, N. J.
- \*Lansing Co., Lansing, Mich.
- \*McKiernan-Terry Corp., New York
- \*Mundy Hoisting Eng. Co., J. S., Newark, N. J.
- \*Novo Engine Co., Lansing, Mich.
- \*Sterling Machy. Corp., Kansas City, Mo.
- \*Street Bros. Mach. Works, Chattanooga, Tenn.
- Brown Clutch Co., Sandusky, Ohio
- Flory Mfg. Co., S., Bangor, Pa.
- Fridy Hoist & Machy. Co., Mountville, Pa.
- Mead-Morrison Mfg. Co., Boston, Mass.
- Rogers Iron Wks. Co., Joplin, Mo.
- Thomas Elevator Co., Chicago, Ill.
- Universal Hoist & Mfg. Co., Cedar Falls, Ia.

## Hoists, Electric

- \*C. H. & E. Mfg. Co., Milwaukee, Wis.
- \*Clyde Iron Wks. Sales Co., Duluth, Minn.
- \*Dake Engine Co., Grand Haven, Mich.
- \*Davis, Inc., Norris K., San Francisco, Calif.
- \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- \*Domestic Eng. & Pump Co., Shippensburg, Pa.
- \*Euclid Crane & Hoist Co., Euclid, Ohio
- \*Jaeger Machine Co., Columbus, Ohio
- \*Lidgerwood Mfg. Co., Elizabeth, N. J.
- \*McKiernan-Terry Corp., New York
- \*Mundy Htg. Eng. Co., J. S., Newark, N. J.
- \*Novo Engine Co., Lansing, Mich.
- \*Sagen Derrick Co., Chicago, Ill.
- \*Sterling Machy. Corp., Kansas City, Mo.
- \*Street Bros. Mach. Wks., Chattanooga, Tenn.
- American Hoist & Derrick Co., St. Paul
- Brown Clutch Co., Sandusky, Ohio
- Detroit Hoist & Mach. Co., Detroit, Mich.
- Ellicott Mach. Corp., Baltimore, Md.
- English Bros. Machy. Co., Kansas City, Mo.
- Flory Mfg. Co., S., Bangor, Pa.
- Fridy Hoist & Machy. Co., Mountville, Pa.
- Gardner-Denver Co., Quincy, Ill.
- Godfrey Conveyor Co., Elkhart, Ind.
- Haisa Mfg. Co., Geo., New York
- Harnischfeger Corp., Milwaukee, Wis.
- Industrial-Brownhoist Corp., Cleveland
- Iowa Mfg. Co., Cedar Rapids, Iowa
- Lambert Hoisting Eng. Co., Newark, N. J.
- Mead-Morrison Mfg. Co., Boston, Mass.
- Northern Engg. Works, Detroit, Mich.
- Orr & Semblower, Reading, Pa.

- Robbins & Myers Co., Springfield, O.
- Rogers Iron Wks. Co., Joplin, Mo.
- Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y.
- Sullivan Machy. Co., Chicago
- Thomas Elevator Co., Chicago
- Treadwell Engg. Co., Easton, Pa.
- Universal Hoist & Mfg. Co., Cedar Falls, Ia.
- Vulcan Iron Works, Wilkes-Barre, Pa.
- Williams Hoist Co., Los Angeles, Calif.

## Hoists, Gasoline

- \*C. H. & E. Mfg. Co., Milwaukee, Wis.
- \*Clyde Iron Wks. Sales Co., Duluth, Minn.
- \*Dake Engine Co., Grand Haven, Mich.
- \*Davis, Inc., Norris K., San Francisco, Calif.
- \*Domestic Eng. & Pump Co., Shippensburg, Pa.
- \*Jaeger Machine Co., Columbus, Ohio
- \*Lansing Co., Lansing, Mich.
- \*Lidgerwood Mfg. Co., Elizabeth, N. J.
- \*McKiernan-Terry Corp., New York
- \*Mundy Htg. Eng. Co., J. S., Newark, N. J.
- \*Novo Engine Co., Lansing, Mich.
- \*Sagen Derrick Co., Chicago
- \*Sterling Machy. Corp., Kansas City, Mo.
- \*Street Bros. Mach. Wks., Chattanooga, Tenn.
- American Cement Mach. Co., Inc., Keokuk, Ia.
- American Hoist & Der. Co., St. Paul, Minn.
- Beach Mfg. Co., Charlotte, Mich.
- Brown Clutch Co., Sandusky, Ohio
- Construction Machy. Co., Waterloo, Ia.
- Ellicott Machine Corp., Baltimore, Md.
- English Bros. Machy. Co., Kansas City, Mo.
- Flory Mfg. Co., S., Bangor, Pa.
- Fridy Hoist & Machy. Co., Mountville, Pa.
- Iowa Mfg. Co., Cedar Rapids, Ia.
- Joliet Mfg. Co., Joliet, Ill.
- Mead-Morrison Mfg. Co., Boston, Mass.
- O. K. Clutch & Machy. Co., Columbia, Pa.
- Orr & Semblower, Reading, Pa.
- Thomas Elevator Co., Chicago
- Universal Hoist & Mfg. Co., Cedar Falls, Ia.
- Willamette-Ersted Co., Portland, Ore.
- Williams Hoist Co., Los Angeles, Calif.

## Hoists, Hand

- \*Beebe Bros., Inc., Seattle, Wash.
- \*Clyde Iron Wks. Sales Co., Duluth, Minn.
- \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- \*Sagen Derrick Co., Chicago
- Stephens-Adamson Mfg. Co., Aurora, Ill.

## Hoists, Motor Truck Body

- \*St. Paul Hyd. Hst. Mfg. Co., St. Paul, Minn.
- \*Trackson Co., Milwaukee, Wis.
- \*Wood Hyd. Hst. & Body Co., Detroit, Mich.
- Commercial Shearing & Stamping Co., Youngstown, O.
- Heil Co., Milwaukee, Wis.
- Hughes-Keenan Co., Mansfield, Ohio
- Van Dorn Iron Works Co., Cleveland, Ohio

## Hoists, Pneumatic

- \*Dake Engine Co., Grand Haven, Mich.
- \*Independent Pneu. Tool Co., Chicago
- Chicago Pneu. Tool Co., New York
- Curtis Pneu. Machy. Co., St. Louis, Mo.
- Detroit Hoist & Mach. Co., Detroit, Mich.
- Gardner-Denver Co., Quincy, Ill.
- Hanna Engg. Works, Chicago
- Ingersoll-Rand Co., New York
- Northern Engg. Works, Detroit, Mich.
- Sullivan Machy. Co., Chicago

## Hoists, Portable

- \*Beebe Bros., Inc., Seattle, Wash.
- \*C. H. & E. Mfg. Co., Milwaukee, Wis.
- \*Clyde Iron Wks. Sales Co., Duluth, Minn.
- \*Novo Engine Co., Lansing, Mich.
- \*Sagen Derrick Co., Chicago
- \*Street Bros. Mach. Works, Chattanooga, Tenn.
- \*Sterling Machy. Corp., Kansas City, Mo.
- \*Trackson Co., Milwaukee, Wis.
- American Hst. & Der. Co., St. Paul, Minn.
- Beckwith Machine Co., Ravenna, Ohio
- Fridy Hoist & Machy. Co., Mountville, Pa.
- Ingersoll-Rand Co., New York
- Joliet Mfg. Co., Joliet, Ill.
- Sullivan Machy. Co., Chicago
- Thomas Elevator Co., Chicago
- W-K-M Co., Inc., Houston, Texas

## Hoists, Steam

- \*Clyde Iron Wks. Sales Co., Duluth, Minn.
- \*Dake Engine Co., Grand Haven, Mich.
- \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- \*Lidgerwood Mfg. Co., Elizabeth, N. J.
- \*McKiernan-Terry Corp., New York
- \*Mundy Htg. Eng. Co., J. S., Newark, N. J.
- \*Street Bros. Mach. Wks., Chattanooga, Tenn.
- American Hoist & Der. Co., St. Paul, Minn.
- Ellicott Mach. Corp., Baltimore, Md.
- Flory Mfg. Co., S., Bangor, Pa.
- Gardner-Denver Co., Quincy, Ill.
- Haisa Mfg. Co., Geo., New York
- Hardie-Tynes Mfg. Co., Birmingham, Ala.
- Mead-Morrison Mfg. Co., Boston, Mass.
- Orr & Semblower, Reading, Pa.

- Rogers Iron Wks. Co., Joplin, Mo.
- Thomas Elevator Co., Chicago
- Treadwell Engg. Co., Easton, Pa.

## Hoists, Tractor-Mounted

- \*Trackson Co., Milwaukee, Wis.
- Resistor Engg. Corp., Tulsa, Okla.
- Willamette-Ersted Co., Portland, Ore.

## Horses, Folding, Steel

- \*Toledo Pressed Steel Co., Toledo, Ohio
- Beasley, J. P., Greenville, Texas

## Hose, Air

- \*Continental Rubber Works, Erie, Pa.
- \*Independent Pneu. Tool Co., Chicago
- \*Schramm, Inc., West Chester, Pa.
- Boston Woven Hose & Rub. Co., Cambridge, Mass.
- Buhl Co., The, Chicago, Ill.
- Chicago Pneu. Tool Co., New York
- Cincinnati Rubber Mfg. Co., Cincinnati, O.
- Cleveland Rock Drill Co., Cleveland, Ohio
- Dallett Co., The, Philadelphia
- Gilman Mfg. Co., East Boston, Mass.
- Goodrich Rubber Co., B. F., Akron, O.
- Goodyear Tire & Rubber Co., Akron, Ohio
- Gustin-Bacon Mfg. Co., Kansas City, Mo.
- Ingersoll-Rand Co., New York
- Mulconroy Co., Inc., Philadelphia
- Pennsylvania Flex. Met. Tubing Co., Phila.
- Republic Rubber Co., Youngstown, Ohio
- United States Rubber Co., New York

## Hose, Water

- \*Continental Rubber Works, Erie, Pa.
- Cincinnati Rubber Mfg. Co., Cincinnati, O.
- Diamond Rubber Co., Inc., Akron, Ohio
- Fabric Fire Hose Co., New York
- Gardner-Denver Co., Quincy, Ill.
- Goodrich Rubber Co., B. F., Akron, Ohio
- Goodyear Tire & Rubber Co., Akron, Ohio
- Mulconroy Co., Philadelphia
- U. S. Rubber Co., New York

## Hose Couplings (See Couplings)

## Houses, Tool, Steel (See Buildings, Steel, Portable)

## Hydraulic Dredges (See Dredges)

## Hydraulic Giants (See Giants)

## Hydraulic Rams (See Rams)

## Ignition Systems

- \*Electric Auto-Lite Co., Toledo, Ohio

## Industrial Railway Cars (See Cars)

## Inks, Drawing

- Carter's Ink Co., Boston, Mass.
- Dietzen Co., Eugene, Chicago
- Higgins & Co., Chas. M., Brooklyn, N. Y.
- Keuffel & Esser Co., Hoboken, N. J.
- Pease Co., C. F., Chicago
- Pelican Works, Gunther Wagner, New York
- Weber Co., F., Philadelphia

## Inspection Laboratories (See Directory in this issue)

## Instruments and Supplies, Surveyors and Engineers

- Alsworth & Sons, Wm., Denver, Colo.
- Beckman Co., L., Toledo, Ohio
- Berger & Sons, O. L., Boston, Mass.
- Brandis & Sons, Inc., Brooklyn, N. Y.
- Buff & Buff Mfg. Co., Boston, Mass.
- Dietzen Co., Eugene, Chicago
- Gurley, W. & L. E., Troy, N. Y.
- Keuffel & Esser Co., Hoboken, N. J.
- Kolesch & Co., New York
- Leupold-Volpel & Co., Portland, Ore.
- Larkin Rule Co., Saginaw, Mich.
- Starrett Co., L. S., Athol, Mass.
- Warren-Knight Co., Philadelphia
- Weber & Co., F., Philadelphia
- White Co., David, Milwaukee, Wis.
- Wood-Regan Inst. Co., South Orange, N. J.

## Insulation, Pipe (See Covering)

## Iron Fence (See Fence)

## Iron Pipe (See Pipe)

## Jacks, Lifting

- \*Templeton, Kenly & Co., Chicago
- Blackhawk Mfg. Co., Milwaukee, Wis.
- Buda Co., Harvey, Ill.
- Duff-Norton Mfg. Co., Pittsburgh, Pa.
- Joyce-Cridland Co., Dayton, Ohio
- Lovejoy Tool Works, Chicago
- Oil Jack Co., Ampere, N. J.
- Rees Mfg. Corp., Pittsburgh, Pa.
- Vernona Tool Works, Verona, Pa.
- Watson-Stillman Co., New York



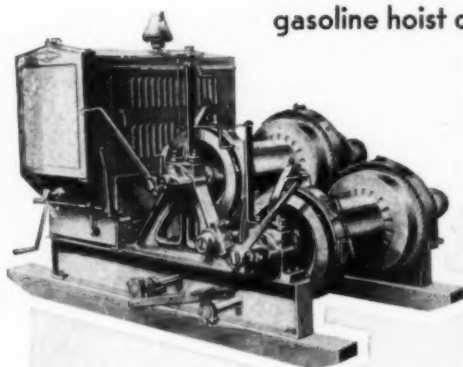
# CLYDE

## HOISTS-DERRICKS

### IF IT'S A CLYDE:—

If the hoist on your job is a Clyde, you'll have dependable power whenever you need it. You'll have no worries about hoist failures, no break downs or loss of hoisting time. You'll have economical maintenance, easy operation and long and lasting service. You'll save time and money, if it's a Clyde.

The illustration shows a Clyde two drum gasoline hoist operating one-yard concrete bucket on Hadley Vocational School building in St. Louis, for the John Hill Construction Co.



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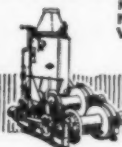
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# WHERE TO PURCHASE

## Jacks, Pipe-Forcing

\*Templeton, Kenly & Co., Chicago  
Blackhawk Mfg. Co., Milwaukee, Wis.  
Clark Co., H. W., Mattoon, Ill.  
Duff-Norton Mfg. Co., Pittsburgh, Pa.  
Easy Mfg. Co., Lincoln, Nebr.  
Giant Mfg. Co., Council Bluffs, Ia.  
Joyce-Cridland Co., Dayton, Ohio  
Roper Corp., Geo. D., Rockford, Ill.

## Jacks, Puller

\*Templeton, Kenly & Co., Chicago  
Duff-Norton Mfg. Co., Pittsburgh, Pa.  
Edelblute Co., T. H., Pittsburgh, Pa.  
Joyce-Cridland Co., Dayton, Ohio  
Watson-Stillman Co., New York

## Joint Compounds, Sewer (See Compounds)

## Joint Materials, Cast Iron Pipe

Atlas Mineral Products Co., Mertstown, Pa.  
Hydraulic Development Co., Boston, Mass.  
Leadite Co., The, Philadelphia  
United Lead Co., New York

## Joints, Pipe, Flexible

\*U. S. Pipe & Fdy. Co., Burlington, N. J.  
Coldwell-Wilcox Co., Newburgh, N. Y.  
Dayton Pipe Coupling Co., Dayton, O.  
National Lead Co., New York  
Dresser Mfg. Co., S. R., Bradford, Pa.  
Victualic Co. of Amer., New York

## Joints, Rail (See Rail and Rail Joints)

## Kerosene Engines (See Engines)

## Kettles, Asphalt and Tar Heating

\*Chausse Oil Burner Co., Elkhart, Ind.  
\*Connery & Co., Inc., Philadelphia  
\*Honhorst Co., Jos., Cincinnati, Ohio  
\*Hvaas & Co., Chas., New York  
\*Littleford Bros., Cincinnati, Ohio  
\*Mohawk Asph. Heater Co., Schenectady, N. Y.  
Acme Road Machy. Co., Frankfort, N. Y.  
Aeroll Burner Co., West New York, N. Y.  
American Steel Works, Kansas City, Mo.  
Barber Asphalt Co., Philadelphia  
Beach Mfg. Co., Charlotte, Mich.  
Charleroi Iron Works, Charleroi, Pa.  
Cummer & Son Co., F. D., Cleveland, O.  
Hauck Mfg. Co., Brooklyn, N. Y.  
Kinney Mfg. Co., Boston, Mass.  
Lancaster Iron Works, Inc., Lancaster, Pa.  
Macleod Co., Cincinnati, Ohio  
Merriman Asphalt Plant, Inc., Lima, Ohio  
Spears-Wells Machy. Co., Oakland, Calif.  
Stuebner Iron Wks., Inc., G. L., Long Island City, N. Y.  
Tarrant Mfg. Co., Saratoga Springs, N. Y.  
Universal Road Machy. Co., Kingston, N. Y.

## Laboratories, Inspection and Testing (See Directory in this issue)

## Lanterns, Contractors'

\*Diets Co., E. E., New York  
\*National Carbide Sales Corp., New York  
Defiance Lantern & Stamping Co., Rochester, N. Y.  
Economy Electric Lantern Co., Chicago  
Handlan Buck Mfg. Co., St. Louis  
National Carbon Co., Inc., New York  
Star Headlight & Lantern Co., Rochester, N. Y.

## Lead Pipe (See Pipe)

## Lettering Guides

Weber Co., F., Philadelphia, Pa.  
Wood-Regan Inst. Co., South Orange, N. J.

## Lighting Plants, Electric (See Electric Lighting Plants)

## Lights, Acetylene (See Floodlights)

## Lights, Warning (See Lanterns, Contractors, or Torches, Warning)

## Liquid Chlorine (See Chlorine)

## Loaders (See Excavators, or Conveyors)

## Locomotive Cranes (See Cranes)

## Locomotives, Contractors'

Baldwin Loco. Wks., Philadelphia  
Brookville Loco. Co., Brookville, Pa.  
Davenport Loco. & Mfg. Co., Davenport, Ia.  
Fate-Root-Heath Co., Plymouth, Ohio  
Heisler Loco. Wks., Erie, Pa.  
Ingersoll-Rand Co., New York  
Lima Loco. Wks., Lima, Ohio  
Mid-West Loco. Wks., Hamilton, Ohio  
Milwaukee Loco. Mfg. Co., Milwaukee, Wis.  
Porter Co., H. K., Pittsburgh, Pa.  
Vulcan Iron Works, Wilkes-Barre, Pa.  
Westinghouse E. & M. Co., E. Pittsburgh  
Whitcomb Co., Geo. D., Rochelle, Ill.

## Lubricants

\*D-A Lubricant Co., Indianapolis, Ind.  
Atlantic Refining Co., Inc., Philadelphia  
Chicago Pneu. Tool Co., New York  
Dixon Crucible Co., Jos., Jersey City, N. J.  
Texas Co., New York

## Lubricators

Bassick Mfg. Co., The, Chicago  
Carr Fastener Co., Cambridge, Mass.  
Chicago Pneu. Tool Co., New York  
Ingersoll-Rand Co., New York  
McCord Radiator Mfg. Co., Detroit, Mich.  
McCullough Mfg. Co., Minneapolis, Minn.

## Machines (See Various Classifications)

## Magazines, Storage, Explosives

\*Littleford Bros., Cincinnati, Ohio  
Atlas Powder Co., Wilmington, Del.  
Du Pont de Nemours & Co., E. I., Wilmington  
Hercules Powder Co., Wilmington, Del.  
New York Blasting Supply Co., New York

## Magnetos

\*Eisemann Magneto Corp., New York  
American Bosch Mag. Corp., Springfield, Mass.  
Splittorf-Bethlehem Elec. Co., Newark, N. J.

## Maintainers, Road

\*Baker Mfg. Co., Springfield, Ill.  
\*Caterpillar Tractor Co., Peoria, Ill.  
\*Foote Bros. Gear & Mach. Co., Chicago  
Adams Co., J. D., Indianapolis, Ind.  
Beach Mfg. Co., Charlotte, Mich.  
Gallion Iron Works & Mfg. Co., Gallion, O.  
Owensboro Ditch & Grad. Co., Owensboro, Ky.  
Root Spring Scraper Co., Kalamazoo, Mich.  
Spears-Wells Machy. Co., Oakland, Calif.  
Western Wheel Scraper Co., Aurora, Ill.  
Willett Mfg. Co., Grand Rapids, Mich.

## Manganese Steel Products (See Steel Products)

## Manhole Covers (See Castings)

## Manila Rope (See Rope)

## Material Elevators (See Elevators)

## Material Hoists (See Hoists)

## Melting Furnaces (See Furnaces)

## Mixer Bodies, Concrete (See Bodies)

## Mixers, Concrete

\*Chain Belt Co., Milwaukee, Wis.  
\*Davis, Inc., Norris R., San Francisco, Calif.  
\*Jaeger Machine Co., Columbus, Ohio  
\*Koehring Co., Milwaukee, Wis.  
\*Kwik-Mix Conc. Mixer Co., Pt. Washington, Wis.  
\*Lakewood Engg. Co., Columbus, Ohio  
\*Lansing Co., Lansing, Mich.  
\*Ransome Conc. Machy. Co., Dunellen, N. J.  
\*Smith Co., T. L., Milwaukee, Wis.  
\*Acme Road Machy. Co., Frankfort, N. Y.  
American Cement Mach. Co., Inc., Keokuk, Ia.  
Anchor Mfg. Co., Chicago  
Archer Iron Works, Chicago  
Atlas Engg. Co., Clintonville, Wis.  
Beach Mfg. Co., Charlotte, Mich.  
Blystone Mfg. Co., Cambridge Springs, Pa.  
Construction Machy. Co., Waterloo, Ia.  
Foote Fdy. Co., J. B., Fredericktown, Ohio  
Gibson Bros. Co., Fredonia, Wis.  
Gray Iron Foundry Co., Reading, Pa.  
Knickerbocker Co., Jackson, Mich.  
Leach Co., Oshkosh, Wis.  
Orr & Sembower, Reading, Pa.  
Remmell Mfg. Co., Kewaskum, Wis.

## Mixers, Mortar

\*C. H. & E. Mfg. Co., Milwaukee, Wis.  
\*Chain Belt Co., Milwaukee, Wis.  
\*Davis, Inc., Norris R., San Francisco, Calif.  
\*Jaeger Machine Co., Columbus, Ohio  
\*Kwik-Mix Conc. Mixer Co., Pt. Washington, Wis.  
\*Lansing Co., Lansing, Mich.  
Anchor Mfg. Co., Chicago, Ill.  
Blystone Mfg. Co., Cambridge Spgs., Pa.  
Leach Co., Oshkosh, Wis.  
Talbot-Flood Mfg. Co., Kansas City, Mo.

## Mortar Boxes (See Boxes)

## Mortar Mixers (See Mixers)

## Mortar Placing Machines (See Placers)

## Motor Trucks (See Trucks)

## Motors, Gasoline (See Engines)

## Motors and Generators, Electric

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
\*Homelite Corp., Port Chester, N. Y.  
\*United States Motors Corp., Oshkosh, Wis.  
American Motors Co., Cedarburg, Wis.  
Century Electric Co., St. Louis, Mo.  
Crocker-Wheeler Co., Ampere, N. J.

Fairbanks, Morse & Co., Chicago  
General Electric Co., Schenectady, N. Y.  
Graybar Electric Co., New York  
Ideal Electric & Mfg. Co., Mansfield, O.  
Lincoln Electric Co., Cleveland, O.  
Northwestern Mfg. Co., Milwaukee, Wis.  
Robbins & Myers Co., Springfield, O.  
Wagner Electric Corp., St. Louis, Mo.  
Westinghouse E. & M. Co., E. Pittsburgh, Pa.

## Mucking Machines

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
Coloder Co., Inc., The, Columbus, Ohio  
Nordberg Mfg. Co., Milwaukee, Wis.  
St. Louis Power Shovel Co., St. Louis, Mo.

## Nozzles, Sluicing (See Giants, Hydraulic)

## Oilers, Road (See Distributors)

## Oils, Road

\*Standard Oil Co. of Ind., Chicago  
\*Standard Oil Co. of N. Y., New York  
Atlantic Refining Co., Inc., Philadelphia  
Barber Asphalt Co., Philadelphia  
Headley Emulsified Prod. Co., Philadelphia  
Standard Oil Co. of La., New Orleans, La.  
Standard Oil Co. of N. J., Newark, N. J.  
Texas Company, New York

## One-Ton Cranes (See Cranes)

## Orange Peel Buckets (See Buckets)

## Painting Machinery, Spray

\*Schramm, Inc., West Chester, Pa.  
Binks Spray Equipment Co., Chicago  
Chicago Pneu. Tool Co., New York  
DeVilbiss Mfg. Co., Toledo, Ohio  
Eclipse Air Brush Co., Newark, N. J.  
Hobart Brothers Co., Troy, Ohio  
Macleod Co., Cincinnati, Ohio  
Matthews Corp., W. N., St. Louis, Mo.  
Milburn Co., Alexander, Baltimore, Mo.  
Pasche Air Brush Co., Chicago, Ill.  
Simons Paint Spray Brush Co., Dayton, O.  
Spraco Painting Equip. Co., Boston, Mass.

## Paints, Metal Protection

\*Barrett Co., New York  
\*Carey Co., Philip, Cincinnati, O.  
\*McEverlast, Inc., Los Angeles, Calif.  
\*Solvay Sales Corp., New York  
Acme White Lead & Color Works, Detroit  
Barber Asphalt Co., Philadelphia  
Berry Bros., Detroit, Mich.  
Cook Paint & Varnish Co., Kansas City, Mo.  
Detroit Graphite Co., Detroit, Mich.  
Detroit White Lead Works, Detroit, Mich.  
Dixon Crucible Co., Jos., Jersey City, N. J.  
Du Pont de Nemours & Co., E. I., Wilmington, Del.  
Headley Emulsified Prod. Co., Philadelphia  
Hoosier Paint Works, Ft. Wayne, Ind.  
Minwax Co., New York  
Pittsburgh Plate Glass Co., Milwaukee, Wis.  
Ruberoid Co., New York  
Sherwin-Williams Co., Cleveland, Ohio  
St. Louis Surfact & Paint Co., St. Louis  
Toch Brothers, New York  
Tropical Paint & Oil Co., Cleveland, Ohio  
Truscon Laboratories, Detroit, Mich.

## Patrol Graders (See Graders)

## Pavement Breakers (See Tools, Pneumatic)

## Pavers, Concrete

\*Chain Belt Co., Milwaukee, Wis.  
\*Foote Co., Nunda, N. Y.  
\*Jaeger Machine Co., Columbus, Ohio  
\*Koehring Co., Milwaukee, Wis.  
\*Ransome Conc. Machy. Co., Dunellen, N. J.  
\*Smith Co., T. L., Milwaukee, Wis.

## Paving Brick (See Brick)

## Paving Guards (See Guards)

## Picks, Hand

Hubbard Co., Pittsburgh, Pa.  
Iron City Tool Works, Pittsburgh, Pa.  
Oliver Iron & Steel Corp., Pittsburgh, Pa.  
Verona Tool Works, Pittsburgh, Pa.  
Warren Tool & Forge Co., Warren, Ohio  
Warwood Tool Co., Wheeling, W. Va.  
Wyoming Shovel Works, Wyoming, Pa.

## Pile Drivers (See Hammers)

## Pile Hammers (See Hammers)

## Piles, Concrete

MacArthur Conc. Pile & Foundation Co., New York  
Mamey Concrete Prods. Corp., Chicago  
Raymond Concrete Pile Co., New York

## Piling, Sheet, Interlocking, Steel

\*Lindheimer, S. W., Chicago  
Bethlehem Steel Co., Bethlehem, Pa.  
Carnegie Steel Co., Pittsburgh, Pa.  
Wemlinger, Inc., New York

If you find any errors or omissions in this Where to Purchase list, please send corrections to CONTRACTORS AND ENGINEERS MONTHLY

# "Continental Equipped"



*Courtesy of A. Guthrie & Co., St. Paul Minn.*

**Continental Air Compressor Hose, Pneumatic Tool Hose, Suction Hose, Water Hose, Steam Hose, Pile Driving Hose, Boots and Oiled Clothing were used on this Job by A. Guthrie & Co. of St. Paul.**

**Get  
In Touch  
with  
Our Nearest  
Branch**

BALTIMORE, MD.	112 W. Pratt St.
BOSTON, MASS.	200 Congress St.
BUFFALO, N. Y.	885 Niagara St.
CHICAGO, ILL.	27 West Illinois St.
CLEVELAND, O.	203 Perry Payne Bldg.
DAYTON, O.	116 So. St. Clair St.
DETROIT, MICH.	5423 12th St.
MILWAUKEE, WIS.	1235 W. Atkinson Ave.
NEW YORK, N. Y.	152 Chambers St.
PHILADELPHIA, PA.	313-319 New St.
PITTSBURGH, PA.	300 Penn Ave.
ST. LOUIS, MO.	221-223 No. 3rd St.
TOLEDO, O.	415 Michigan St.

## **Continental Rubber Works, Erie, Pa.**

C. C. KERNER, 152 Chambers St., New York, N. Y.—U. S. A.—Exclusive Foreign Representative



# WHERE TO PURCHASE

## Pipe, Cast Iron

\*Central Foundry Co., New York  
 \*U. S. Pipe & Fdy. Co., Burlington, N. J.  
 American Cast Iron Pipe Co., Birmingham, Ala.  
 Clow & Sons, James B., Chicago  
 Donaldson Iron Co., Emaus, Pa.  
 Fox & Co., John, New York  
 Glamorgan Pipe & Fdy. Co., Lynchburg, Va.  
 McWane Cast Iron Pipe Co., Birmingham, Ala.  
 National C. I. Pipe Co., Birmingham, Ala.  
 Warren Fdy. & Pipe Co., New York  
 Wood & Co., R. D., Philadelphia

## Pipe, Concrete

\*Newark Concrete Pipe Co., Newark, N. J.  
 Gray Concrete Co., Thomasville, N. C.  
 Lock Joint Pipe Co., Amper, N. J.  
 Massey Concrete Prods. Corp., Chicago  
 Shearman Conc. Pipe Co., Inc., Little Rock, Ark.

## Pipe, Concrete, Reinforced

\*Newark Conc. Pipe Co., Newark, N. J.  
 Concrete Prods. Co., Pittsburgh, Pa.  
 Independent Concrete Pipe Co., Indianapolis  
 Lock Joint Pipe Co., Amper, N. J.  
 Massey Concrete Prods. Corp., Chicago  
 Shearman Conc. Pipe Co., Inc., Little Rock, Ark.

## Pipe, Culvert (See Culverts; or Pipe, Concrete)

## Pipe, Lead

Clow & Sons, James B., Chicago  
 Eagle-Picher Lead Co., Chicago  
 Gardiner Metal Co., Chicago  
 National Lead Co., New York  
 United Lead Co., New York  
 Windsor Mfg. Co., Milwaukee, Wis.

## Pipe, Steel

Babcock & Wilcox Tube Co., New York  
 Bethlehem Steel Co., Bethlehem, Pa.  
 Biggs Boiler Works Co., Akron, Ohio  
 Clow & Sons, James B., Chicago  
 Jones & Laughlin Steel Co., Pittsburgh  
 Lancaster Iron Works, Lancaster, Pa.  
 National Tube Co., Pittsburgh, Pa.  
 Petroleum Iron Works, Sharon, Pa.  
 Wheeling Steel Corp., Wheeling, W. Va.  
 Youngstown Sheet & Tube Co., Youngstown, O.

## Pipe, Steel, Spiral

Abendroth & Root Mfg. Co., New York  
 Chicago Metal Mfg. Co., Chicago  
 Taylor Forge & Pipe Works, Chicago

## Pipe, Steel or Iron, Riveted

\*Connersy & Co., Inc., Philadelphia  
 \*Honhorst Co., Jos., Cincinnati, Ohio  
 \*Littleford Bros., Cincinnati, Ohio  
 Abendroth & Root Mfg. Co., New York  
 Biggs Boiler Works Co., Akron, Ohio  
 Chattanooga Boiler & Tank Co., Chattanooga  
 Chicago Bridge & Iron Works, Chicago  
 East Jersey Pipe Co., New York  
 Elliott Mach. Corp., Baltimore, Md.  
 Graver Tank & Mfg. Corp., E. Chicago, Ind.  
 Hammond Iron Works, Warren, Pa.  
 Hardesty Mfg. Co., R., Denver, Colo.  
 Horton Stl. Tank & Mfg. Co., Chicago  
 Lancaster Iron Works, Lancaster, Pa.  
 Petroleum Iron Works Co., Sharon, Pa.  
 Pittsburgh-Des Moines Stl. Co., Pittsburgh  
 Stover Steel Tank & Mfg. Co., Freeport, Ill.  
 Taylor Forge & Pipe Works, Chicago  
 Tippet & Wood, Phillipsburg, N. J.

## Pipe, Vitritified Clay

Dee Co., Wm. E., Chicago, Ill.  
 Dickey Clay Mfg. Co., W. S., Kansas City  
 Evans & Howard Fire Brick Co., St. Louis  
 Laclede-Christy Clay Prods. Co., St. Louis  
 Pacific Clay Products Co., Los Angeles, Calif.

## Pipe, Wood

American Wood Pipe Co., Tacoma, Wash.  
 Federal Tank & Pipe Co., Seattle, Wash.  
 Michigan Pipe Co., Bay City, Mich.  
 Pacific Clay Products Co., Los Angeles, Calif.  
 Redwood Mfrs. Co., San Francisco, Calif.  
 Standard Wood Pipe Co., Williamsport, Pa.  
 Wyckoff & Sons Co., A., Elmira, N. Y.

## Pipe, Wrought Iron

Byers Co., A. M., Pittsburgh, Pa.  
 Cohoes Rolling Mill Co., Cohoes, N. Y.  
 Reading Iron Co., Reading, Pa.  
 South Chester Tube Co., Chester, Pa.

## Pipe Bending Machines (See Bending Machines)

## Pipe Covering (See Covering)

## Pipe Cutters (See Cutters)

## Pipe Fittings (See Fittings)

## Pipe Forcing Jacks (See Jacks)

## Pipe Handling Machinery (See Derricks)

## Pipe Joint Materials (See Joint Materials)

## Pipe Joints, Flexible (See Joints)

## Pipe Laying Derricks (See Derricks)

## Pipe Pushers (See Jacks)

## Pipe Threaders (See Threaders)

## Placers, Concrete, Pneumatic

\*Ransome Concrete Machy. Co., Dunellen, N. J.

## Placers, Mortar, Pneumatic

\*Ransome Concrete Machy. Co., Dunellen, N. J.  
 Cement Gun Co., Allentown, Pa.  
 Macleod Co., Cincinnati, Ohio  
 Pneumatic Corp., Ltd., Long Beach, Calif.

## Planes, Electric

Carter Co., Inc., R. L., Phoenix, N. Y.  
 Wappat, Inc., Pittsburgh, Pa.

## Planes, Pneumatic

\*Tousley Tool Co., Cleveland, Ohio

## Planking, Asphalt (See Flooring)

## Plants, Construction (See Specific Types)

## Plows, Road and Rooter

\*Austin-Western Road Machy. Co., Chicago  
 \*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.  
 \*General Wheelbarrow Co., Cleveland, Ohio  
 \*Harris Co., B. W. & Leo, Minneapolis, Minn.  
 Acme Road Machy. Co., Frankfort, N. Y.  
 Adams Co., J. D., Indianapolis, Ind.  
 American Steel Scraper Co., Sidney, Ohio  
 Beach Mfg. Co., Charlotte, Mich.  
 Deere & Co., Moline, Ill.  
 Gallion Iron Wks. & Mfg. Co., Gallion, Ohio  
 Hackley Equip. Co., P. B., San Francisco  
 Sidney Steel Scraper Co., Sidney, Ohio  
 Slusser-McLean Scraper Co., Sidney, Ohio  
 Spears Wells Machy. Co., Oakland, Calif.  
 Western Wheel Scraper Co., Aurora, Ill.  
 Wiard Plow Co., Batavia, N. Y.

## Plows, Snow (See Snow Removal Machinery)

## Pneumatic Tools (See Tools, Pneumatic)

## Portable Buildings, Steel (See Buildings)

## Portable Steel Derricks (See Derricks)

## Portland Cement (See Cement)

## Post Hole Augers (See Augers)

## Pots, Pouring, Asphalt and Tar

\*Mohawk Asph. Heater Co., Schenectady, N. Y.  
 \*Littleford Bros., Cincinnati, Ohio  
 Acme Road Machy. Co., Frankfort, N. Y.  
 Barber Asphalt Co., Philadelphia  
 Beach Mfg. Co., Charlotte, Mich.  
 Durlach Can & Iron Wks., Brooklyn, N. Y.  
 Tarrant Mfg. Co., Saratoga Springs, N. Y.

## Powder, Black

Atlas Powder Co., Wilmington, Del.  
 Du Pont de Nemours & Co., E. L., Wilmington  
 Egyptian Powder Co., East Alton, Ill.  
 Giant Powder Co., San Francisco, Calif.  
 Hercules Powder Co., Wilmington, Del.  
 Trojan Powder Co., Allentown, Pa.  
 United States Powder Co., Terre Haute, Ind.

## Power Pumps (See Pumps)

## Power Transmission (See Chains or Belts)

## Presses, Baling

Davenport Mfg. Co., Davenport, Ia.  
 Economy Baler Co., Ann Arbor, Mich.  
 Fanous Mfg. Co., E. Chicago, Ind.  
 Galland-Henig Mfg. Co., Milwaukee, Wis.

## Puller Jacks (See Jacks)

## Pullers, Stump

\*Beebe Bros., Inc., Seattle, Wash.  
 \*Clyde Iron Works Sales Co., Duluth, Minn.  
 Bennett & Co., H. L., Westerville, Ohio  
 Dorsey Bros., Elba, Ala.  
 Waldron Corp., John, New Brunswick, N. J.

## Pumping Outfits, Diaphragm

\*C. H. & E. Mfg. Co., Milwaukee, Wis.  
 \*Chain Belt Co., Milwaukee, Wis.  
 \*Jaeger Machine Co., Columbus, Ohio  
 \*Novo Engine Co., Lansing, Mich.  
 \*Sterling Machy. Corp., Kansas City, Mo.  
 Barnes Mfg. Co., Mansfield, Ohio  
 Humphries Mfg. Co., Mansfield, Ohio  
 Nelson Bros. Co., Saginaw, Mich.  
 Tool & Device Corp., Waterford, N. Y.  
 Trench & Marine Pump Co., New York

## Pumps, Air-Lift

American Steam Pump Co., Battle Creek, Mich.  
 Chicago Pneumatic Tool Co., New York  
 Gardner-Denver Co., Quincy, Ill.  
 Indiana Pump & Compressor Co., Indianapolis  
 Ingersoll-Rand Co., New York  
 Sullivan Machinery Co., Chicago  
 Worthington Pump & Machy. Corp., New York

## Pumps, Centrifugal

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
 \*Chain Belt Co., Milwaukee, Wis.  
 \*C. H. & E. Mfg. Co., Milwaukee, Wis.  
 \*Domestic Eng. & Pump Co., Shippensburg, Pa.  
 \*Ebel Holst & Pump Co., Lansing, Mich.

## \*Homelite Corp., Port Chester, N. Y.

\*Jaeger Machine Co., Columbus, Ohio  
 \*Novo Engine Co., Lansing, Mich.  
 Aldrich Pump Co., Allentown, Pa.  
 American Steam Pump Co., Battle Creek, Mich.  
 American Well Works, Aurora, Ill.  
 Aurora Pump & Mfg. Co., Aurora, Ill.  
 Barnes Mfg. Co., Mansfield, Ohio  
 Brown Clutch Co., Sandusky, Ohio  
 Buffalo Steam Pump Co., Buffalo, N. Y.  
 Chicago Pump Co., Chicago  
 Dayton-Dowd Co., Quincy, Ill.  
 Dean Hill Pump Co., Anderson, Ind.  
 De Laval Steam Turbine Co., Trenton, N. J.  
 Deming Co., Salem, Ohio  
 Economy Pumping Machy. Co., Chicago  
 Elliott Mach. Corp., Baltimore, Md.  
 Evinrude Div., Outboard Motors Corp., Milwaukee  
 Fairbanks, Morse & Co., Chicago  
 Goulds Pumps, Inc., Seneca Falls, N. Y.  
 Humphries Mfg. Co., Mansfield, Ohio  
 Indiana Pump & Comp. Co., Indianapolis, Ind.  
 Ingersoll-Rand Co., New York  
 Keystone Driller Co., Beaver Falls, Pa.  
 LaBour Co., Inc., Elkhart, Ind.  
 Leecourtney Co., Newark, N. J.  
 Manistee Iron Works, Manistee, Mich.  
 Morris Machine Works, Baldwinville, N. Y.  
 Pelton Water Wheel Co., San Francisco, Calif.  
 Pennsylvania Pump & Comp. Co., Easton, Pa.  
 Rumsey Pump Co., Seneca Falls, N. Y.  
 United Iron Works, Inc., Kansas City, Mo.  
 Universal Motor Co., Oshkosh, Wis.  
 Warren Steam Pump Co., Warren, Mass.  
 Weinman Pump Mfg. Co., Columbus, Ohio  
 Worthington Pump & Machy. Corp., New York

## Pumps, Centrifugal, Portable

\*Carter Co., Ralph B., Hackensack, N. J.  
 \*Chain Belt Co., Milwaukee, Wis.  
 \*Domestic Eng. & Pump Co., Shippensburg, Pa.  
 \*Homelite Corp., Port Chester, N. Y.  
 \*Jaeger Machine Co., Columbus, Ohio  
 \*Novo Engine Co., Lansing, Mich.  
 \*Sterling Machy. Corp., Kansas City, Mo.  
 American Stm. Pump Co., Battle Creek, Mich.  
 Barnes Mfg. Co., Mansfield, Ohio  
 Humphries Mfg. Co., Mansfield, Ohio  
 LaBour Co., Inc., Elkhart, Ind.  
 Portable Power Co., New York  
 Trench & Marine Pump Co., New York  
 Union Iron Works, Inc., Hoboken, N. J.

## Pumps, Deep Well

\*Domestic Eng. & Pump Co., Shippensburg, Pa.  
 \*Novo Engine Co., Lansing, Mich.  
 Alamo Engine Co., Hillsdale, Mich.  
 Aldrich Pump Co., Allentown, Pa.  
 American Stm. Pump Co., Battle Creek, Mich.  
 American Well Works, Aurora, Ill.  
 Barnes Mfg. Co., Mansfield, Ohio  
 Byron Jackson Co., Berkeley, Calif.  
 Cook, Inc., A. D., Lawrenceburg, Ind.  
 Dean Hill Pump Co., Anderson, Ind.  
 Deming Co., Salem, Ohio  
 Gardner-Denver Co., Quincy, Ill.  
 Goulds Pumps, Inc., Seneca Falls, N. Y.  
 Humphries Mfg. Co., Mansfield, Ohio  
 Indiana Pump & Comp. Co., Indianapolis, Ind.  
 Ingersoll-Rand Co., New York  
 Keystone Driller Co., Beaver Falls, Pa.  
 Layne & Bowler, Inc., Memphis, Tenn.  
 McDonald Mfg. Co., A. Y., Dubuque, Iowa  
 Myers & Bros. Co., F. E., Ashland, Ohio  
 Pomona Pump Co., Pomona, Calif.  
 Rumsey Pump Co., Seneca Falls, N. Y.  
 Sterling Pump Corp., Stockton, Calif.  
 Weinman Pump Mfg. Co., Columbus, Ohio  
 Worthington Pump & Machy. Corp., New York

## Pumps, Diaphragm

\*C. H. & E. Mfg. Co., Milwaukee, Wis.  
 \*Carter Co., Ralph B., New York  
 \*Chain Belt Co., Milwaukee, Wis.  
 \*Domestic Eng. & Pump Co., Shippensburg, Pa.  
 \*Jaeger Machine Co., Columbus, Ohio  
 \*Novo Engine Co., Lansing, Mich.  
 Barnes Mfg. Co., Mansfield, Ohio  
 Brown Clutch Co., Sandusky, Ohio  
 Construction Machinery Co., Waterloo, Ia.  
 Deming Co., Salem, Ohio  
 Dorr Co., New York  
 Edson Mfg. Corp., South Boston, Mass.  
 Goulds Pumps, Inc., Seneca Falls, N. Y.  
 Humphries Mfg. Co., Mansfield, Ohio  
 Waldo Bros. Co., Boston, Mass.  
 Witte Engine Works, Kansas City, Mo.

## Pumps, Dredging

\*Novo Engine Co., Lansing, Mich.  
 Elliott Mach. Corp., Baltimore, Md.  
 Erie Pump & Engine Works, Medina, N. Y.  
 Morris Machine Works, Baldwinville, N. Y.

## Pumps, Power

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
 \*C. H. & E. Mfg. Co., Milwaukee, Wis.  
 \*Domestic Eng. & Pump Co., Shippensburg, Pa.  
 \*Jaeger Machine Co., Columbus, Ohio  
 \*Novo Engine Co., Lansing, Mich.  
 Alamo Iron Works, San Antonio, Texas

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover \*





## "Don't Shoot— Pump"

### Goodbye Water Hammer

That bang — bang — banging in pipe lines — caused by the constant hammering of water from the ordinary road pump, is shooting away a big chunk of contractors' profits.

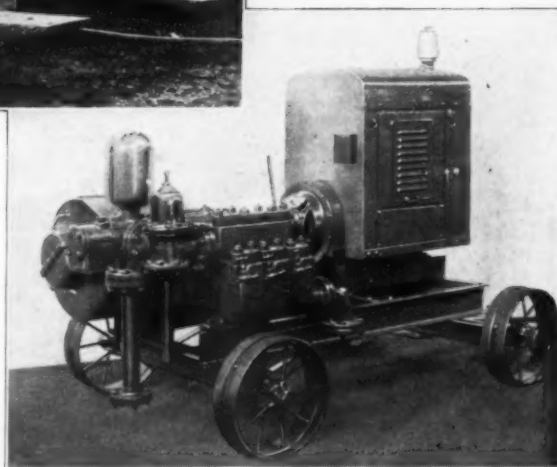
For this destructive "water hammer" wrecks pipe lines long before their time. And it is one of the biggest reasons for costly pipe line troubles.

You can save those dollars for yourself and be assured of a smoother, steadier supply of water at the paver with the Novo Flud-Oild Triplex Road Pump. Operating at 200 r.p.m. instead of the customary 65, the Novo Triplex produces 600 water strokes per minute.

This means a smooth, even flow at a uniform pressure — and the end of "water hammer."

But that's not all:

**15% More Power:** Powered by the famous Novo four cylinder, Timken Roller Bearing equipped engines, the Novo Triplex



is at least 15% higher powered than any other road pump.

**Flud-Oild:** All moving parts are constantly flooded with oil—with the completely enclosed Flud-Oild lubrication system.

**Saves 15 to 25%:** The patented Novo Water Governor automatically keeps excessive pressures out of the line—yet maintains the proper pressure steadily at the paver —and saves 15 to 25% in gasoline.

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Clarence E. Bement, Vice-Pres. & Gen. Mgr.

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Address.....

City..... State.....

# WHERE TO PURCHASE

## Pumps, Power (Cont.)

Aldrich Pump Co., Allentown, Pa.  
American Steam Pump Co., Battle Creek, Mich.  
American Well Works, Aurora, Ill.  
Aurora Pump & Mfg. Co., Aurora, Ill.  
Barnes Mfg. Co., Mansfield, Ohio  
Chicago Pump Co., Chicago  
Clayton-Dowd Co., Quincy, Ill.  
Dean Bros. Co., Indianapolis, Ind.  
De Laval Steam Turbine Co., Trenton, N. J.  
Deming Co., Salem, Ohio  
Fairbanks, Morse & Co., Chicago  
Gardner-Denver Co., Quincy, Ill.  
Goulds Pumps, Inc., Seneca Falls, N. Y.  
Humphreys Mfg. Co., Mansfield, Ohio  
Ingersoll-Rand Co., New York  
Kinney Mfg. Co., Boston, Mass.  
LaBour Co., Inc., Elkhart, Ind.  
Lawrence Machinery Co., Lawrence, Mass.  
Lecourtenay Co., Newark, N. J.  
Myers & Bros. Co., F. E., Ashland, Ohio  
Rumsey Pump Co., Seneca Falls, N. Y.  
Weinman Pump Mfg. Co., Columbus, Ohio  
Worthington Pump & Machy. Corp., New York  
Yeomans Bros. Co., Chicago

## Pumps, Tar and Asphalt

Aldrich Pump Co., Allentown, Pa.  
American Steam Pump Co., Battle Creek, Mich.  
Barber Asphalt Co., Philadelphia  
Gardner-Denver Co., Quincy, Ill.  
Goulds Pumps, Inc., Seneca Falls, N. Y.  
Kinney Mfg. Co., Boston, Mass.  
Madsen Iron Works, Huntington Pk., Calif.  
Worthington Pump & Machy. Corp., New York

## Pumps, Triplex

\*C. H. & E. Mfg. Co., Milwaukee, Wis.  
\*Domestic Eng. & Pump Co., Shippensburg, Pa.  
\*Jager Machine Co., Columbus, Ohio  
\*Novo Engine Co., Lansing, Mich.  
Aldrich Pump Co., Allentown, Pa.  
Buffalo Steam Pump Co., Buffalo, N. Y.  
Deming Co., Salem, Ohio  
Goulds Pumps, Inc., Seneca Falls, N. Y.  
Luitweiler Pumping Eng. Co., Rochester, N. Y.  
Platt Iron Works, Dayton, Ohio  
Rumsey Pump Co., Seneca Falls, N. Y.  
Worthington Pump & Machy. Corp., New York

## Radial Brick Chimneys (See Chimneys)

## Radiators for Gasoline Engines

McCord Radiator Mfg. Co., Detroit, Mich.  
Modine Mfg. Co., Racine, Wis.  
Perfec Corp., Milwaukee, Wis.  
Young Radiator Co., Racine, Wis.

## Rail and Rail Joints

Bethlehem Steel Co., Bethlehem, Pa.  
Carnegie Steel Co., Pittsburgh, Pa.  
Koppel Ind. Car & Equip. Co., Koppel, Pa.  
Sweet's Steel Co., Williamsport, Pa.

## Railway Cars (See Cars)

## Rams, Hydraulic

Deming Co., Salem, Ohio  
Goulds Pumps, Inc., Seneca Falls, N. Y.  
Johnson Mfg. Co., Seattle, Wash.  
Rife Hydraulic Engine Co., New York  
Rumsey Pump Co., Seneca Falls, N. Y.

## Reinforced Concrete Pipe (See Pipe)

## Reinforcing Fabric for Concrete (See Wire Fabric)

## Reinforcing Steel for Concrete (See Steel, Reinforcing)

## Relief Valves (See Valves)

## Revolving Derricks (See Derricks)

## Rivet Forges (See Forges)

## Riveted Pipe (See Pipe)

## Riveters, Pneumatic (See Tools, Pneumatic)

## Road Drags (See Drags)

## Road Finishers (See Finishers)

## Road Graders (See Graders)

## Road Maintainers (See Maintainers)

## Road Oils (See Oils)

## Road Oilers (See Distributors)

## Road Plows (See Plows)

## Road Rollers (See Rollers)

## Road Scrapers (See Maintainers)

## Rock Asphalt (See Asphalt, Rock)

## Rock Crushers (See Crushers)

## Rock Drills (See Drills)

## Rod Cutters (See Cutters)

## Rollers, Embankment

\*Buffalo-Springfield Roller Co., Springfield, O.  
Acme Road Machinery Co., Frankfort, N. Y.  
Rohr & Co., H. W., Los Angeles, Calif.

## Rollers, Road and Paving

\*Austin-Western Road Machy. Co., Chicago  
\*Buffalo-Springfield Roller Co., Springfield, O.  
\*Good Roads Machy. Co., Kennett Square, Pa.  
\*Hercules Co., Marion, Ohio  
\*Huber Mfg. Co., Marion, Ohio  
\*Riddell Co., W. A., Bucyrus, Ohio  
Acme Road Machy. Co., Frankfort, N. Y.  
Barber Asphalt Co., Philadelphia  
Beach Mfg. Co., Charlotte, Mich.  
Erie Machine Shops, Erie, Pa.  
Galion Iron Works & Mfg. Co., Galion, Ohio  
Horst & Strietor Co., Davenport, Iowa  
Universal Road Machy. Co., Kingston, N. Y.

## Rollers, Trench

\*Trackson Co., Milwaukee, Wis.

## Rooter Plows (See Plows)

## Rope, Manila

\*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.  
\*Williamsport Wire Rope Co., Williamsport, Pa.  
American Mfg. Co., Brooklyn, N. Y.  
Columbian Rope Co., Auburn, N. Y.  
Cupples Cordage Co., Brooklyn, N. Y.  
Hooven & Allison Co., Xenia, Ohio  
Hunt Co., Inc., C. W., New Brighton, N. Y.  
Kelly Co., R. A., Xenia, Ohio  
New Bedford Cordage Co., New Bedford, Mass.  
Peoria Cordage Co., Peoria, Ill.  
Plymouth Cordage Co., N. Plymouth, Mass.  
Portland Cordage Co., Portland, Ore.  
St. Louis Cordage Mills, St. Louis, Mo.  
Tubbs Cordage Co., San Francisco, Calif.  
Wall Rope Works, New York  
Waterbury Co., New York  
Whitlock Cordage Co., New York

## Rope, Wire

\*American Steel & Wire Co., Chicago  
\*Williamsport Wire Rope Co., Williamsport, Pa.  
American Cable Co., Inc., New York  
Broderick & Bascom Rope Co., St. Louis, Mo.  
Fischer & Hayes Rope & Steel Co., Chicago  
Green, L. P., Chicago  
Hazard Wire Rope Co., Wilkes-Barre, Pa.  
Leschen & Sons Rope Co., A., St. Louis, Mo.  
Macwhirte Co., Kenosha, Wis.  
Page Steel & Wire Co., Bridgeport, Conn.  
Roehling's Sons Co., J. A., Trenton, N. J.  
Upson-Walton Co., Cleveland, Ohio  
Wickwire-Spencer Steel Co., New York

## Rope Fittings, Wire (See Fittings)

## Rotary Scrapers (See Scrapers)

## Rubber Block Paving (See Block Paving)

## Rubber Tires (See Tires)

## Rules, Measuring

Keuffel & Esser Co., Hoboken, N. J.  
Lufkin Rule Co., Saginaw, Mich.  
Pease Co., C. F., Chicago  
Westcott Rule Co., Seneca Falls, N. Y.

## Salamanders, Coke or Wood-Burning

\*General Wheelbarrow Co., Cleveland, Ohio  
\*Honhorst Co., Jos., Cincinnati, Ohio  
\*Littleford Bros., Cincinnati, Ohio  
Donley Bros., Cleveland, Ohio  
Durlach Carb. & Iron Works, Brooklyn, N. Y.  
Jackson Mfg. Co., Harrisburg, Pa.

## Salamanders, Oil-Burning

\*Littleford Bros., Cincinnati, Ohio  
\*Mohawk Asph. Heater Co., Schenectady, N. Y.  
Aerol Burner Co., West New York, N. J.  
American Steel Works, Kansas City, Mo.  
Hauk Mfg. Co., Brooklyn, N. Y.  
MacLeod Co., Cincinnati, Ohio

## Sand Dryers (See Dryers)

## Sand Spreaders (See Spreaders)

## Sand Washers (See Washers)

## Saw Rigs, Portable

\*Chain Belt Co., Milwaukee, Wis.  
\*C. H. & E. Mfg. Co., Milwaukee, Wis.  
Construction Machy. Co., Waterloo, Iowa  
DeWalt Products Co., Leola, Pa.  
Jones Superior Machine Co., Chicago  
Knickerbocker Co., Jackson, Mich.  
Leach Co., Oakbrook, Wis.  
Red Star Products Co., Cleveland, Ohio  
Witte Engine Works, Kansas City, Mo.

## Saws, Power, Hand

\*Tousley Tool Co., Cedar Rapids, Iowa  
Black & Decker Mfg. Co., Towson, Md.  
DeWalt Products Corp., Lancaster, Pa.  
Ingersoll-Rand Co., New York  
Irwin Mfg. Co., Cincinnati, Ohio  
Michel Electric Hand Saw Co., Chicago  
Portable Power Tool Corp., Warsaw, Ind.  
Porter-Cable-Hutchinson Corp., Syracuse, N. Y.  
Reed-Prentice Corp., Worcester, Mass.  
Skilsaw, Inc., Chicago  
Speedway Mfg. Co., Cicero, Ill.  
Stanley Electric Tool Co., New Britain, Conn.  
Syntron Co., Pittsburgh, Pa.

Van Dorn Elec. Tool Co., Baltimore, Md.  
Wappat, Inc., Pittsburgh, Pa.  
Wodack Electric Tool Corp., Chicago

## Scaffolds, Steel, Adjustable

\*Toledo Pressed Steel Co., Toledo, Ohio  
Fuller Co., H. B., St. Paul, Minn.  
Steel Scaffolding Co., Evansville, Ind.  
Tilley Ladders Co., Inc., The John, Watervliet, N. Y.

## Scarifiers

\*Austin-Western Road Machy. Co., Chicago  
\*Baker Mfg. Co., Springfield, Ill.  
\*Buffalo-Springfield Roller Co., Springfield, O.  
\*Caterpillar Tractor Co., Peoria, Ill.  
\*Good Roads Machy. Co., Kennett Square, Pa.  
\*Huber Mfg. Co., Marion, Ohio  
\*Hvass & Co., Chas., New York  
\*Riddell Co., W. A., Bucyrus, Ohio  
Acme Road Machy. Co., Frankfort, N. Y.  
Adams Co., J. D., Indianapolis, Ind.  
American Tractor Equip. Co., Oakland, Calif.  
Galion Iron Works & Mfg. Co., Galion, O.  
Rome Mfg. Co., Rome, N. Y.  
Ryan Mfg. Co., Chicago  
Spears-Wells Machy. Co., Oakland, Calif.  
Universal Road Machy. Co., Kingston, N. Y.  
Western Wheelbarrow Co., Aurora, Ill.  
Wiard Plow Co., Batavia, N. Y.

## Scarifiers, Teeth for

\*Shunk Mfg. Co., Bucyrus, Ohio  
American Manganese Steel Co., Chicago Hgts., Ill.  
Unit Corp. of Amer., Forgings Div., Milwaukee

## Scoops, Hand (See Shovels)

## Scoops, Horse or Tractor Drawn (See Scrapers, Drag; Scrapers, Rotary; or Scrapers, Wheeled)

## Scoops, Skimmer and Trench (See Shovels, Convertible)

## Scrapers, Drag (or Pans)

\*Austin-Western Road Machy. Co., Chicago  
\*Harris Co., B. W. & Leo, Minneapolis, Minn.  
\*Lansing Co., Lansing, Mich.  
Adams Co., J. D., Indianapolis, Ind.  
American Steel Scraper Co., Sidney, Ohio  
Chattanooga Wheelbarrow Co., Chattanooga, Tenn.  
Jackson Mfg. Co., Harrisburg, Pa.  
Sidney Steel Scraper Co., Sidney, Ohio  
Slusser-McLean Scraper Co., Sidney, Ohio  
Western Wheelbarrow Co., Aurora, Ill.

## Scrapers, Drag, Power (For use on Dragline Cableways)

\*Hayward Co., New York  
\*Sauerman Bros., Chicago  
Beach Mfg. Co., Charlotte, Mich.  
Beaumont Co., R. H., Philadelphia  
Garat Mfg. Co., Chicago  
Green, L. P., Chicago  
Iowa Mfg. Co., Cedar Rapids, Iowa

## Scrapers, Dragline (For use on Cranes)

American Manganese Steel Co., Chicago Hgts., Ill.  
Browning Crane Co., Cleveland, Ohio  
Bucyrus-Erie Co., South Milwaukee, Wis.  
Harnischfeger Corp., Milwaukee, Wis.  
Link-Belt Co., Chicago  
Monaghan Mfg. Corp., Chicago  
Page Engineering Co., Chicago

## Scrapers, Fresno (See Scrapers, Rotary)

## Scrapers, Road (See Maintainers)

## Scrapers, Rotary

\*Austin-Western Road Machy. Co., Chicago  
\*Baker Mfg. Co., Springfield, Ill.  
\*Euclid Crane & Hoist Co., Euclid, Ohio  
\*General Wheelbarrow Co., Cleveland, Ohio  
\*Harris Co., B. W. & Leo, Minneapolis, Minn.  
\*Lansing Co., Lansing, Mich.  
\*Schaefer Co., Gustav, Cleveland, Ohio  
Adams Co., J. D., Indianapolis, Ind.  
American Steel Scraper Co., Sidney, Ohio  
Atlas Scraper Co., Los Angeles, Calif.  
Beach Mfg. Co., Charlotte, Mich.  
Galion Iron Wks. & Mfg. Co., Galion, Ohio  
Killefer Mfg. Corp., Los Angeles, Calif.  
Lean Co., Roderick, Mansfield, Ohio  
Sidney Steel Scraper Co., Sidney, Ohio  
Slusser-McLean Scraper Co., Sidney, Ohio  
Solano Iron Works, Berkeley, Calif.  
Western Wheelbarrow Co., Aurora, Ill.  
Wiard Plow Co., Batavia, N. Y.

## Scrapers, Self-Loading (See Scrapers, Rotary; Scrapers, Wheeled)

## Scrapers, Wheeled

\*Austin-Western Rd. Machy. Co., Chicago  
\*Baker Mfg. Co., Springfield, Ill.  
\*Euclid Crane & Hoist Co., Euclid, Ohio  
\*General Wheelbarrow Co., Cleveland, Ohio



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## Scrapers, Wheeled (Cont.)

\*Harris Co., B. W. & Leo, Minneapolis, Minn.  
 \*Lansing Co., Lansing, Mich.  
 \*Riddell Co., W. A., Bucyrus, Ohio  
 Acme Road Machy. Co., Frankfort, N. Y.  
 Adams Co., J. D., Indianapolis, Ind.  
 American Steel Scraper Co., Sidney, Ohio  
 Atlas Scraper Co., Los Angeles, Calif.  
 Beach Mfg. Co., Charlotte, Mich.  
 Galion Iron Wks. & Mfg. Co., Galion, Ohio  
 Miami Trailer Scraper Co., Troy, Ohio  
 Miskin Scraper Works, Ucon, Idaho  
 Shaw Exc. & Tools Co., Worthington, Ohio  
 Sidney Steel Scraper Co., Sidney, Ohio  
 Slusser-McLean Scraper Co., Sidney, Ohio  
 Western Wheeled Scraper Co., Aurora, Ill.

## Screen, Hand

\*Hetsel Steel Form & Iron Co., Warren, O.

## Screens, Sand and Gravel

\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
 \*Austin-Western Road Machy. Co., Chicago  
 Chain-Belt Co., Milwaukee, Wis.  
 \*Good Roads Machy. Co., Kennett Square, Pa.  
 \*Littleford Bros., Cincinnati, Ohio  
 \*Pioneer Gravel Equip. Mfg. Co., Minneapolis  
 Acme Road Machy. Co., Frankfort, N. Y.  
 Atlas Engg. Co., Clintonville, Wis.  
 Bartlett & Snow Co., C. O., Cleveland, Ohio  
 Beach Mfg. Co., Charlotte, Mich.  
 Chicago Automatic Conv. Co., Chicago  
 Delster Concentrator Co., Ft. Wayne, Ind.  
 Gifford-Wood Co., Hudson, N. Y.  
 Haisa Mfg. Co., Geo., New York  
 Hendrick Mfg. Co., Carbondale, Pa.  
 Iowa Mfg. Co., Cedar Rapids, Iowa  
 Jeffrey Mfg. Co., Columbus, Ohio  
 Link-Belt Co., Chicago, Ill.  
 Merriman Asphalt Plant, Inc., Lima, Ohio  
 Morrow Mfg. Co., Wellston, Ohio  
 Neff & Fry Co., Camden, Ohio  
 New England Road Machy. Co., South Boston, Mass.

New Holland Machine Co., New Holland, Pa.  
 New Jersey Wire Cloth Co., Trenton, N. J.  
 Robins Conv. Belt Co., New York  
 Rogers Iron Works Co., Joplin, Mo.  
 Sackett Screen & Chute Co., H. B., Chicago  
 Smith Engineering Works, Milwaukee, Wis.  
 Stephens-Adams Mfg. Co., Aurora, Ill.  
 Traylor Engg. & Mfg. Co., Allentown, Pa.  
 United Iron Works, Kansas City, Mo.  
 Universal Crusher Co., Cedar Rapids, Iowa  
 Universal Road Machy. Co., Kingston, N. Y.  
 Webster & Weller Mfg. Co., Chicago  
 Weimer Co., H. W., Milwaukee, Wis.  
 Western Wheeled Scraper Co., Aurora, Ill.

## Semi-Trailers (See Trailers)

## Sewer Blocks, Segment (See Blocks)

## Sewer Castings (See Castings)

## Sewer Pipe (See Pipe, Concrete, Vitriified Clay or Cast Iron)

## Sewer Pipe Joint Compounds (See Compounds)

## Sharpeners, Drill-Steel

\*Hardsoc Wonder Drill Co., Ottumwa, Iowa  
 \*Schramm, Inc., West Chester, Pa.  
 Gardner-Denver Co., Quincy, Ill.  
 Ingersoll-Rand Co., New York  
 Lake Shore Engine Works, Marquette, Mich.  
 Sullivan Machinery Co., Chicago

## Sheet Steel Piling (See Piling)

## Sheeting Drivers (See Hammers)

## Shores

Concrete Engg. Co., Omaha, Neb.  
 Dayton Sure Grip & Shore Co., Dayton, Ohio  
 M. & M. Wire Clamp Co., Minneapolis, Minn.  
 O. D. G. Co., Owensboro, Ky.  
 Red Star Products Corp., Cleveland, Ohio  
 Roos Co., H. W., Cincinnati, Ohio  
 Ros-Meyer-Hecht Co., Cincinnati, Ohio  
 Symons Clamp & Mfg. Co., Chicago  
 Toledo Steel Tube Co., Toledo, Ohio  
 Universal Form Clamp Co., Chicago

## Shovels, Convertible

\*Bay City Shovels, Inc., Bay City, Mich.  
 \*General Excavator Co., Marion, Ohio  
 \*Insley Mfg. Co., Indianapolis, Ind.  
 \*Koehring Co., Milwaukee, Wis.  
 \*Osgood Co., Marion, Ohio  
 \*Speeder Machy. Corp., Cedar Rapids, Iowa  
 American Hoist & Derrick Co., St. Paul, Minn.  
 Byers Mach. Co., Ravenna, Ohio  
 Keystone Driller Co., Beaver Falls, Pa.  
 Manitowoc Engg. Works, Manitowoc, Wis.  
 Mead-Morrison Mfg. Co., Boston, Mass.  
 Northwest Engineering Co., Chicago  
 Ohio Locomotive Crane Co., Bucyrus, Ohio  
 Ohio Power Shovel Co., Lima, Ohio  
 Orton Crane & Shovel Co., Chicago  
 Star Drilling Machine Co., Akron, Ohio  
 Thew Shovel Co., Lorain, Ohio

## Shovels, Diesel

\*Koehring Co., Milwaukee, Wis.  
 \*Osgood Co., Marion, Ohio

\*Speeder Machy. Corp., Cedar Rapids, Ia.  
 Bucyrus-Erie Co., So. Milwaukee, Wis.  
 Harnischfeger Corp., Milwaukee, Wis.  
 Industrial Brownhoist Corp., Cleveland, O.  
 Link-Belt Co., Chicago  
 Marion Steam Shovel Co., Marion, Ohio  
 Ohio Power Shovel Co., Lima, Ohio

## Shovels, Electric

\*Bay City Shovels, Inc., Bay City, Mich.  
 \*General Excavator Co., Marion, Ohio  
 \*Koehring Co., Milwaukee, Wis.  
 \*Osgood Co., Marion, Ohio  
 \*Speeder Machy. Corp., Cedar Rapids, Iowa  
 American Hoist & Derrick Co., St. Paul  
 Bucyrus-Erie Co., South Milwaukee, Wis.  
 Harnischfeger Corp., Milwaukee, Wis.  
 Industrial Brownhoist Corp., Cleveland, Ohio  
 Link-Belt Co., Chicago  
 Manitowoc Engg. Works, Manitowoc, Wis.  
 Marion Steam Shovel Works, Marion, Ohio  
 Mead-Morrison Mfg. Co., Boston, Mass.  
 Northwest Engineering Co., Chicago  
 Ohio Power Shovel Co., Lima, Ohio  
 Thew Shovel Co., Lorain, Ohio

## Shovels, Gasoline

\*Bay City Shovels, Inc., Bay City, Mich.  
 \*General Excavator Co., Marion, Ohio  
 \*Insley Mfg. Co., Indianapolis, Ind.  
 \*Koehring Co., Milwaukee, Wis.  
 \*Osgood Co., Marion, Ohio  
 \*Speeder Machy. Corp., Cedar Rapids, Iowa  
 \*Trackson Co., Milwaukee, Wis.  
 American Hoist & Derrick Co., St. Paul  
 Bucyrus-Erie Co., So. Milwaukee, Wis.  
 Byers Machine Co., Ravenna, Ohio  
 Harnischfeger Corp., Milwaukee, Wis.  
 Industrial Brownhoist Corp., Cleveland, Ohio  
 Keystone Driller Co., Beaver Falls, Pa.  
 Link-Belt Co., Chicago  
 Manitowoc Engg. Works, Manitowoc, Wis.  
 Marion Steam Shovel Co., Marion, Ohio  
 Mead-Morrison Mfg. Co., Boston, Mass.  
 Northwest Engg. Co., Chicago  
 Ohio Locomotive Crane Co., Bucyrus, Ohio  
 Ohio Power Shovel Co., Lima, Ohio  
 Orton Crane & Shovel Co., Chicago  
 Star Drilling Machine Co., Akron, Ohio  
 Thew Shovel Co., Lorain, Ohio  
 Universal Power Shovel Co., Milwaukee, Wis.

## Shovels, Steam

\*Osgood Co., Marion, Ohio  
 American Hoist & Derrick Co., St. Paul  
 Bucyrus-Erie Co., Milwaukee, Wis.  
 Industrial Brownhoist Corp., Cleveland, O.  
 Keystone Driller Co., Beaver Falls, Pa.  
 Marion Steam Shovel Co., Marion, Ohio  
 Orton Crane & Shovel Co., Chicago  
 Thew Shovel Co., Lorain, Ohio

## Shovels, Spades and Scoops, Hand

American Mfg. Co., Chattanooga, Tenn.  
 Ames Shovel & Tool Co., Boston, Mass.  
 Baldwin Tool Works, Parkersburg, W. Va.  
 Beall Bros., Alton, Ill.

Conneaut Shovel Co., Conneaut, Ohio  
 Indiana Shovel Co., New Castle, Ind.  
 Jackson Shovel Co., Montpelier, Ind.  
 Pittsburgh Shovel Co., Pittsburgh, Pa.  
 Wood Shovel & Tool Co., Piqua, Ohio  
 Wyoming Shovel Works, Wyoming, Pa.

## Shovels, Tractor-Mounted

\*Bay City Shovels, Inc., Bay City, Mich.  
 \*Trackson Co., Milwaukee, Wis.  
 Blair Mfg. Co., W. M., Chicago  
 Clark Tractor Co., Battle Creek, Mich.  
 Miami Trailer-Scraper Co., Troy, Ohio  
 Nordberg Mfg. Co., Milwaukee, Wis.  
 Resistor Engg. Corp., Tulsa, Okla.  
 Trackson Co., Milwaukee, Wis.

## Sidewalk Forms (See Forms)

## Silicate of Soda

Grasselli Chemical Co., Cleveland, Ohio  
 Philadelphia Quartz Co., Philadelphia  
 Standard Silicate Co., Cincinnati, Ohio

## Snow Fence (See Fence)

## Snow Plow Blades (See Blades)

## Snow Removal Machinery (See also Graders, Tractors and Trucks)

\*Baker Mfg. Co., Springfield, Ill.  
 \*Barber-Greene Co., Aurora, Ill.  
 \*Burch Corp., The, Crestline, Ohio  
 \*Good Roads Machy. Co., Kennett Square, Pa.  
 \*Nelson Iron Works, N. P., Passaic, N. J.  
 Batavia Steel Plate Const. Co., Batavia, N. Y.  
 Clark Tractor Co., Battle Creek, Mich.  
 Detroit Harvester Co., Detroit, Mich.  
 Empire Plow Co., Cleveland, Ohio  
 Fox Rotary Snow Broom Co., New York  
 Frink, Carl H., Clayton, Thousand Is., N. Y.  
 Haisa Mfg. Co., Geo., New York  
 Heil Co., The, Milwaukee, Wis.  
 Klauer Mfg. Co., Dubuque, Iowa  
 LaPlante Choate Mfg. Co., Cedar Rapids, Ia.  
 Maine Steel Prods. Co., So. Portland, Maine

Rotary Snow Plow Co., Minneapolis, Minn.  
 Walsh's Holyoke Stl. Bir. Wks., Holyoke, Mass.  
 Walter Motor Truck Co., L. I. City, N. Y.  
 Wausau Iron Works, Wausau, Wis.  
 Western Wheeled Scraper Co., Aurora, Ill.

## Spaders, Pneumatic (See Tools, Pneumatic)

## Spades (See Shovels)

## Spiral Pipe (See Pipe)

## Sprayers, Asphalt and Tar, Hand

\*Chausse Oil Burner Co., Elkhart, Ind.  
 \*Connery & Co., Inc., Philadelphia  
 \*Littleford Bros., Cincinnati, Ohio  
 \*Mohawk Asphalt Heater Co., Schenectady, N. Y.  
 Acroll Burner Co., West New York, N. J.  
 Kinney Mfg. Co., Boston, Mass.  
 Spears-Wellis Machy. Co., Oakland, Calif.

## Spray Painting Machinery (See Painting Machinery)

## Spreaders, Asphalt

\*Burch Corp., Crestline, Ohio

## Spreaders, Calcium Chloride

\*Solvay Sales Corp., New York

## Spreaders, Sand and Chip

\*Good Roads Machy. Co., Kennett Square, Pa.  
 \*Hvas & Co., Chas., New York  
 Goroco Mechanical Spreader Co., Philadelphia  
 Highway Service, Inc., New Bedford, Mass.  
 Tarrant Mfg. Co., Saratoga Springs, N. Y.  
 Universal Road Machy. Co., Kingston, N. Y.  
 Warren Bros. Co., Boston, Mass.

## Spreaders, Stone

\*Austin-Western Road Machy. Co., Chicago  
 \*Burch Corp., The, Crestline, Ohio  
 \*Hvas & Co., Chas., New York  
 Galion Iron Works & Mfg. Co., Galion, Ohio  
 Highway Service, Inc., New Bedford, Mass.  
 Merriman Asphalt Plant, Inc., Lima, Ohio  
 Universal Road Machy. Co., Kingston, N. Y.

## Stacks, Steel (See Chimneys)

## Steam Shovels (See Shovels)

## Steel, Drill, Hollow

Paragon Stl. & Tool Co., E. Rutherford, N. J.  
 S K F Steels Inc., New York  
 Swedish-American Steel Corp., Brooklyn, N. Y.  
 United Alloy Steel Corp., Canton, Ohio  
 Vulcan Tool Mfg. Co., Quincy, Mass.

## Steel, Reinforcing, for Concrete

Carnegie Steel Co., Pittsburgh, Pa.  
 Concrete Steel Co., New York  
 Laclede Steel Co., St. Louis, Mo.  
 Milton Mfg. Co., Milton, Pa.  
 Ryerson & Son, Inc., Jos. T. Chicago  
 Truscon Steel Co., Youngstown, Ohio

## Steel, Structural

\*Blaw-Knox Co., Pittsburgh, Pa.  
 American Bridge Co., New York  
 Bellefontaine Br. & Stl. Co., Bellefontaine, O.  
 Bethlehem Steel Co., Bethlehem, Pa.  
 Carnegie Steel Co., Pittsburgh, Pa.  
 Central Steel Br. Co., Indianapolis, Ind.  
 Champion Bridge Co., Wilmington, Ohio  
 Clinton Bridge Works, Clinton, Iowa  
 Eastern Bridge & Struc. Co., Worcester, Mass.  
 Fort Pitt Bridge Works, Pittsburgh, Pa.  
 Ingalls Iron Works Co., Birmingham, Ala.  
 Inter. Steel & Iron Co., Evansville, Ind.  
 Lakeside Bridge & Steel Co., Louisville, Ky.  
 McClintic-Marshall Co., Pittsburgh, Pa.  
 Milwaukee Bridge Co., Milwaukee, Wis.  
 Minneapolis-Moline Power Impl. Co., Minn.  
 Missouri Vy. Br. & Ir. Co., Leavenworth, Kans.  
 Mt. Vernon Bridge Co., Mt. Vernon, Ohio  
 Penn Bridge Co., Beaver Falls, Pa.  
 Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.  
 Richmond Struc. Steel Co., Richmond, Va.  
 Ryerson & Son, Inc., Jos. T., Chicago  
 Virginia Br. & Iron Co., Roanoke, Va.  
 Wheeling Struc. Steel Co., Wheeling, W. Va.  
 Wisconsin Bridge & Iron Co., No. Milwaukee, Wis.

## Steel Buildings (See Buildings)

## Steel Castings (See Castings)

## Steel Chimneys (See Chimneys)

## Steel Derricks (See Derricks)

## Steel Pipe (See Pipe)

## Steel Products, Manganese

\*Riddell Co., W. A., Bucyrus, Ohio  
 American Manganese Stl. Co., Chicago Hgts., Ill.  
 Republic Steel Corp., Youngstown, Ohio  
 Taylor-Wharton Iron & Steel Co., High bridge, N. J.

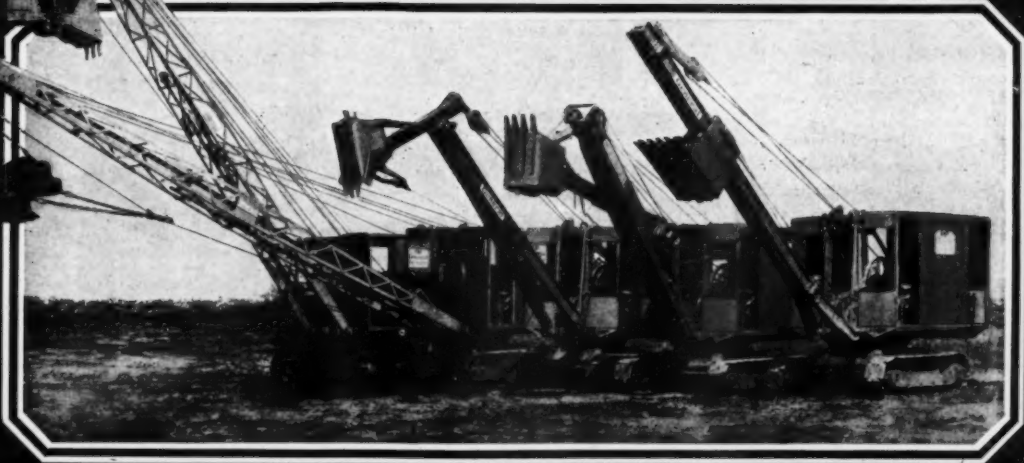
## Steel Sheet Piling (See Piling)

## Steel Tanks (See Tanks)

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover \*



# The General's Staff



Alert, wide-awake distributors know the importance of selling a powerful rugged, simple, large capacity shovel, suitable for universal service. The **GENERAL** (now powered with a 62 H. P. engine running at a conservative rpm.) meets every requirement. That's why the distributors who first started with **GENERALS** are still selling them. The combination of a good distributor selling a good machine, can not be beat. When you need the best shovel, clamshell, dragline, backhoe, skimmer, crane, backfiller or magnet, write, wire or phone at our expense for the name of the nearest representative and for bulletin No. 3012 CE.

**THE GENERAL EXCAVATOR CO., MARION, OHIO**

DISTRIBUTORS IN ALL PRINCIPAL CENTERS—GENERALS EVERYWHERE

# • • • • W H E R E T O P U R C H A S E • • • •

## Stiffing Derricks (See Derricks)

## Stone Spreaders (See Spreaders)

## Storage Bins (See Bins)

## Straightedges

- \*Heltzel Steel Form & Iron Co., Warren, O.
- \*Lakewood Engg. Co., Columbus, Ohio

## Street Castings (See Castings)

## Structural Steel (See Steel)

## Stump Pullers (See Pullers)

## Subgraders

- \*Blaw-Knox Co., Pittsburgh, Pa.
- \*Heltzel Steel Form & Iron Co., Warren, Ohio
- \*Koehring Co., Milwaukee, Wis.
- \*Lakewood Engg. Co., Columbus, Ohio
- Hug Co., The, Highland, Ill.

## Surface Heaters, Asphalt (See Heaters)

## Surfacers and Grinders, Concrete

- \*Concrete Surfacing Machy. Co., Cincinnati, O.
- \*Tousley Tool Co., Cleveland, Ohio
- Chicago Pneumatic Tool Co., New York
- Cleveland Pneu. Tool Co., Cleveland, O.
- Dallett Co., The, Philadelphia, Pa.
- Ingersoll-Rand Co., New York

## Surveying Instruments (See Instruments)

## Tampers, Pneumatic (See Tools, Pneumatic)

## Tanks, Air Compressor

- \*Connelly & Co., Inc., Philadelphia
- \*Littleford Bros., Cincinnati, Ohio
- \*Schramm, Inc., West Chester, Pa.
- Biggs Boiler Works, Akron, Ohio
- Chicago Bridge & Iron Works, Chicago
- Chicago Pneumatic Tool Co., New York
- Graver Tank & Mfg. Co., East Chicago, Ind.
- Heil Co., Milwaukee, Wis.
- Ingersoll-Rand Co., New York
- Lancaster Iron Works, Lancaster, Pa.
- National Tube Co., Pittsburgh, Pa.
- Petroleum Iron Works Co., Sharon, Pa.
- Pittsburgh-Des Moines Steel Co., Pittsburgh
- Seafie & Sons, W. B., Pittsburgh, Pa.
- Stover Steel Tank & Mfg. Co., Freeport, Ill.
- Westinghouse Trac. Brake Co., Wilmerding, Pa.
- Worthington Pump & Machy. Corp., New York
- Youngtown Blr. & Tank Co., Youngstown, O.

## Tanks, Gasoline Storage

- Beatrice Stl. Tank Mfg. Co., Beatrice, Neb.
- Biggs Boiler Works, Akron, Ohio
- Birmingham Tank Co., Birmingham, Ala.
- Bowser & Co., Inc., S. F., Ft. Wayne, Ind.
- Burnham Boiler Corp., Irvington, N. Y.
- Caldwell Co., W. E., Louisville, Ky.
- Chicago Bridge & Iron Works, Chicago
- Columbian Steel Tank Co., Kansas City, Mo.
- Graver Tank & Mfg. Co., East Chicago, Ind.
- Heil Co., Milwaukee, Wis.
- Lancaster Iron Works, Inc., Lancaster, Pa.
- Petroleum Iron Works Co., Sharon, Pa.
- Pittsburgh-Des Moines Steel Co., Pittsburgh
- Road Supply & Metal Co., Topeka, Kans.
- Tokheim Oil Tank & Pump Co., Ft. Wayne, Ind.
- Wayne Co., Ft. Wayne, Ind.

## Tanks, Steel

- \*Connelly & Co., Philadelphia
- \*Honhorst Co., Jos., Cincinnati, O.
- \*Littleford Bros., Cincinnati, Ohio
- Beatrice Steel Tank Mfg. Co., Beatrice, Neb.
- Biggs Boiler Works, Akron, Ohio
- Birmingham Tank Co., Birmingham, Ala.
- Bowser & Co., Inc., S. F., Ft. Wayne, Ind.
- Burnham Boiler Corp., Irvington, N. Y.
- Butler Mfg. Co., Minneapolis, Minn.
- Caldwell Co., W. E., Louisville, Ky.
- Chattanooga Blr. & Tk. Co., Chattanooga, Ga.
- Chicago Bridge & Iron Works, Chicago
- Cole Mfg. Co., R. D., Newnan, Ga.
- Columbian Steel Tank Co., Kansas City, Mo.
- Dover Boiler Works, New York
- Edwards Mfg. Co., Cincinnati, Ohio
- Farrell Mfg. Co., Joliet, Ill.
- Graver Tank & Mfg. Co., E. Chicago, Ind.
- Hardesty Mfg. Co., R., Denver, Colo.
- Heil Co., Milwaukee, Wis.
- Hendrick Mfg. Co., Carbondale, Pa.
- Lancaster Iron Works, Lancaster, Pa.
- McClintic-Marshall Co., Pittsburgh, Pa.
- N. Y. Central Ir. Wks. Co., Hagerstown, Md.
- Petroleum Iron Works Co., Sharon, Pa.
- Pittsburgh-Des Moines Steel Co., Pittsburgh
- Road Supply & Metal Co., Topeka, Kans.
- Seafie & Sons, W. B., Pittsburgh, Pa.
- United Iron Works, Inc., Kansas City, Mo.
- Youngtown Boiler & Tank Co., Youngstown, O.

## Tanks, Wood

- Ame Tank Co., New York
- Beatrice Steel Tank Mfg. Co., Beatrice, Neb.
- Caldwell Co., W. E., Louisville, Ky.
- Davis & Son, G. M., Palatka, Fla.
- Eagle Tank Co., Chicago
- Hauser-Stander Tank Co., Cincinnati, Ohio

- Kalamazoo Tank & Silo Co., Kalamazoo, Mich.
- National Tk. & Pipe Co., Portland, Ore.
- Pacific Tank & Pipe Co., San Francisco, Calif.
- Redwood Mfrs. Co., San Francisco, Calif.
- Stearns Lumber Co., A. T., Boston, Mass.
- U. S. Wind Eng. & Pump Co., Batavia, Ill.
- Wendnagel & Co., Chicago

## Tapes, Steel and Cloth

- Dietzen Co., Eugene, New York
- Keuffel & Esser Co., Hoboken, N. J.
- Lufkin Rule Company, Saginaw, Mich.
- Starrett Co., The L. S., Athol, Mass.

## Tar

- \*Barrett Co., New York
- American Tar Products Co., Pittsburgh, Pa.

## Tarpaulin

- \*Fulton Bag & Cotton Mills, Atlanta, Ga.
- Canvas Products Co., St. Louis, Mo.
- Daniels, Inc., C. R., New York
- Goss Co., J. C., Detroit, Mich.

## Tents

- \*Fulton Bag & Cotton Mills, Atlanta, Ga.
- Canvas Products Co., St. Louis, Mo.
- Compac Tent Corp., Indianapolis, Ind.
- Daniels, Inc., C. R., New York
- Meyer & Co., L. M., Springfield, Mass.

## Testers, Subgrade

- \*Heltzel Steel Form & Iron Co., Warren, O.
- \*Lakewood Engg. Co., Columbus, Ohio

## Testing Laboratories (See Directory in this issue)

## Thawing Torches (See Torches)

## Threaders, Pipe

- Armstrong Mfg. Co., Bridgeport, Conn.
- Borden Co., Warren, Ohio
- Jarecki Mfg. Co., Erie, Pa.
- Oster Mfg. Co., Cleveland, Ohio
- Toledo Pipe Threading Mach. Co., Toledo, O.
- Williams Tool Corp., Cleveland, Ohio

## Ties, Bar

- Symons Clamp & Mfg. Co., Chicago

## Ties, Form (See Clamps and Ties, Form)

## Ties, Steel

- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie Steel Co., Pittsburgh, Pa.
- Easton Car & Const. Co., Easton, Pa.
- International Steel Tie Co., Cleveland, Ohio
- Koppel Ind. Car & Equip. Co., Koppel, Pa.
- Sweet's Steel Co., Williamsport, Pa.

## Ties, Wall

- Berger Mfg. Co., Canton, Ohio
- Concrete Steel Co., New York
- Consolidated Exp. Metal Co., Wheeling, W. Va.
- Donley Bros. Co., Cleveland, Ohio
- Milwaukee Corr. Co., Milwaukee, Wis.
- M. & M. Wire Clamp Co., Minneapolis, Minn.
- Reeves Mfg. Co., Dover, Ohio
- Wedgit Tie Co., Inc., New York

## Tile, Drainage

- American Vitritied Prod. Co., Akron, Ohio
- Dee Co., Wm. E., Chicago, Ill.
- Dickey Mfg. Co., W. S., Kansas City, Mo.
- Evans & Howard Fire Brick Co., St. Louis
- Minnesota Pipe & Tile Co., Mankato, Minn.
- National Drain Tile Co., Terre Haute, Ind.

## Tires, Rubber

- Dunlap Tire & Rub. Corp. of Amer., Buffalo, N. Y.
- Firestone Tire & Rubber Co., Akron, O.
- Fisk Tire Co., Chicopee Falls, Mass.
- General Tire & Rubber Co., Akron, Ohio
- Goodrich Rubber Co., B. F., Akron, Ohio
- Goodyear Tire & Rubber Co., Akron, Ohio
- Hood Rubber Prod. Co., Inc., Watertown, Mass.
- Kelly-Springfield Tire Co., New York
- U. S. Tire Co., New York

## Tool Houses (See Buildings)

## Tools (See various classifications, such as Branding Tools, etc.)

## Tools, Pneumatic

- \*Hardsoc Wonder Drill Co., Ottumwa, Iowa
- \*Independent Pneu. Tool Co., Chicago
- \*McKiernan-Terry Corp., New York
- \*Schramm, Inc., West Chester, Pa.
- \*Tousley Tool Co., Cleveland, Ohio
- Buhl Co., The, Chicago
- Chicago Pneumatic Tool Co., New York
- Cleveland Pneumatic Tool Co., Cleveland, O.
- Dayton Pneumatic Tool Co., Dayton, Ohio
- Gardner-Denver Co., Quincy, Ill.
- Gilman Mfg. Co., E. Boston, Mass.
- Helwig Mfg. Co., St. Paul, Minn.
- Ingersoll-Rand Co., New York
- Keller, Inc., Wm. H., Grand Haven, Mich.
- Sullivan Machy. Co., Chicago, Ill.

## Torches, Blow

- \*Williams Co., G. H., Erie, Pa.
- American Steel Works, Kansas City, Mo.
- Everhot Mfg. Co., Maywood, Ill.
- Hauck Mfg. Co., Brooklyn, N. Y.
- Milburn Co., Alexander, Baltimore, Md.
- Prest-O-Lite Co., Inc., New York

## Torches, Cutting and Welding (See Welding Apparatus)

## Torches, Thawing and Heating

- \*Chausse Oil Burner Co., Elkhart, Ind.
- \*Connelly & Co., Philadelphia
- \*Littleford Bros., Cincinnati, Ohio
- \*Mohawk Asph. Heater Co., Schenectady, N. Y.
- Aeroil Burner Co., West New York, N. J.
- American Steel Works, Kansas City, Mo.
- Hauck Mfg. Co., Brooklyn, N. Y.
- MacLeod Co., Cincinnati, Ohio

## Torches, Warning

- \*Toledo Pressed Steel Co., Toledo, Ohio
- Consolidated Iron-Steel Mfg. Co., Cleveland, O.

## Tower Hoists (See Hoists)

## Towers, Concrete Placing (See Chutes and Towers)

## Tracks, Industrial and Portable

- \*Inley Mfg. Co., Indianapolis, Ind.
- \*Lakewood Engg. Co., Columbus, Ohio
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie Steel Co., Carnegie, Pa.
- Easton Car & Const. Co., Easton, Pa.
- Gregg Co., Ltd., Hackensack, N. J.
- Hunt Co., Inc., C. W., New Brighton, N. Y.
- Koppel Ind. Car & Equip. Co., Koppel, Pa.
- Sweet's Steel Co., Williamsport, Pa.
- St. Louis Frog & Switch Co., St. Louis, Mo.

## Traction Treads (See Treads)

## Tractor Hitches (See Hitches)

## Tractor Shovels (See Shovels)

## Trailers

- \*Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- \*Caterpillar Tractor Co., Peoria, Ill.
- \*Cleveland Tractor Co., Cleveland, Ohio
- \*Foote Bros. Gear & Machine Co., Chicago
- \*International Harvester Co., Chicago, Ill.
- Case Threshing Mach. Co., J. L., Racine, Wis.
- Clark Tractor Co., Battle Creek, Mich.
- Linn Mfg. Co., Morris, N. Y.
- Lombard Tractor & Truck Corp., New York
- Mead-Morrison Mfg. Co., E. Boston, Mass.
- Minneapolis-Moline Power Impl. Co., Minneapolis
- Yuba Mfg. Co., San Francisco, Calif.

## Trailers and Semi-Trailers

- \*Electric Wheel Co., Quincy, Ill.
- \*Hvass & Co., Chas., New York
- \*Schaefer Co., Gustav, Cleveland, Ohio
- \*Williams Co., G. H., Erie, Pa.
- Clark Tractor Co., Battle Creek, Mich.
- Detroit Trailer & Mach. Co., Detroit, Mich.
- Eagle Wagon Works, Auburn, N. Y.
- Easton Car & Const. Co., Easton, Pa.
- Fruehauf Trailer Co., Detroit, Mich.
- Highway Trailer Co., Edgerton, Wis.
- Imperial Machine Co., Minneapolis, Minn.
- LaPlant-Chaste Mfg. Co., Cedar Rapids, Ia.
- Miami Trailer-Scrapper Co., Troy, Ohio
- Muskogee Iron Works, Muskogee, Okla.
- Rex-Watson Corp., Canastota, N. Y.
- Rogers Bros. Corp., Albion, Pa.
- Streich & Bros. Co., A., Oshkosh, Wis.
- Trailmobile Co., Cincinnati, Ohio
- Troy Trailer & Wagon Co., Troy, Ohio
- Whitehead & Kales Co., Detroit, Mich.
- Winsor Tractor Equip. Corp., Ann Arbor, Mich.

## Trailers, Heavy Machinery

- \*Electric Wheel Co., Quincy, Ill.
- \*Hvass & Co., Chas., New York
- \*Williams Co., G. H., Erie, Pa.
- Acme Road Machy. Co., Frankfort, N. Y.
- Aradia Trailer Corp., Newark, N. J.
- Highway Trailer Co., Edgerton, Wis.
- Miami Trailer-Scrapper Co., Troy, Ohio
- Rogers Bros. Corp., Albion, Pa.
- Winsor Tractor Equip. Corp., Ann Arbor, Mich.

## Transformers, Electric

- \*Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- American Brown Boveri Elec. Corp., Camden, N. J.
- Duncan Elec. Mfg. Co., Lafayette, Ind.
- General Electric Co., Schenectady, N. Y.
- Kuhlman Electric Co., Bay City, Mich.
- Sangamo Electric Co., Springfield, Ill.
- Wagner Electric Corp., St. Louis, Mo.
- Westinghouse Elec. & Mfg. Co., E. Pittsburgh

## Treads, Crawler

- \*Electric Wheel Co., Quincy, Ill.
- \*Moon Track Co., Chicago, Ill.
- \*Jaeger Machine Co., Columbus, Ohio
- \*Riddell Co., W. A., Bucyrus, Ohio

If you find any errors or omissions in this Where to Purchase list, please send corrections to CONTRACTORS AND ENGINEERS MONTHLY

# The Trail of the "Road Hogs" Becomes a Passable Road



## WARCO

### POWER GRADERS HAVE:

- One-Man Control
- Roller Bearings
- Patented Head-Type Steering
- Choice of center or near control models
- Three Sizes—Six Models
- Optional Tractor Power Unit
- WARCO Rear-Type Steel, or Rubber Crawlers, interchangeable with rubber-tired rear wheels
- I-Beam Frame; Enclosed Lifting Gears; Heavy, Cast Steel Circle, etc.
- Attachments including Independent Scarifier, Bulldozer and Snow Plow



A remote mountain road, scarcely more than a trail becomes a passable motor road under the ministrations of this pair of powerful WARCO "Road-Hog" Power Graders. Shale-like rock is cut, and thrown out to make a smooth pathway for vehicles. We shall be glad to tell you more about WARCOS. Get in touch with our nearest Distributor, or write us direct.

Every citizen is entitled to a passable road the year around. Why favor the few who live on main highways, when passable roads can now be provided for all, at costs within the reach of every community. Public officials concerned with road and street problems, owe their taxpayers a complete investigation of WARCO Power Graders. Contractors, too, find WARCO Road Machinery a mighty profitable investment.

No longer need the whole neighborhood turn to work the roads.

## W. A. Riddell Company, Bucyrus, O.

POWER & DRAWN GRADERS—WHEELED SCOOPS—REAR-TYPE CRAWLERS FOR TRACTORS



# WHERE TO PURCHASE

## Treads, Crawler (Cont.)

\*Trackson Co., Milwaukee, Wis.  
American Manganese Steel Co., Chicago Hgts., Ill.  
Rex-Watson Corp., Canastota, N. Y.  
Trucktor Corp., Newark, N. J.  
Wehr Co., Milwaukee, Wis.

## Trench Braces (See Braces)

## Trench Excavators (See Excavators and also Shovels)

## Trench Pumps (See Pumps)

## Trench Rollers (See Rollers)

## Triplex Pumps (See Pumps)

## Truck Bodies, Concrete (See Bodies)

## Truck Cranes (See Cranes)

## Trucks, Cement Bag

\*Electric Wheel Co., Quincy, Ill.  
American Pulley Co., Philadelphia  
Anchor Post Fence Co., Baltimore, Md.  
Case Crane & Eng. Co., Columbus, Ohio  
Clark Co., Geo. F., Windsor Locks, Conn.  
Fairbanks Co., New York

## Trucks, Motor

\*Dodge Bros. Corp., Detroit, Mich.  
\*International Harvester Co., Chicago  
\*White Co., Cleveland, Ohio  
Acme Motor Truck Co., Cadillac, Mich.  
Atterbury Motor Car Co., Buffalo, N. Y.  
Autocar Co., Ardmore, Pa.  
Brookway Motor Truck Co., Cortland, N. Y.  
Chevrolet Motor Co., Flint, Mich.  
Clydesdale Motor Truck Co., Clyde, Ohio  
Diamond T Motor Car Co., Chicago  
Duplex Truck Co., Lansing, Mich.  
Fagel Motors Co., Detroit, Mich.  
Federal Motor Truck Co., Detroit, Mich.  
Ford Motor Co., Detroit, Mich.  
Four Wheel Drive Auto Co., Clintonville, Wis.  
General Motors Truck Co., Pontiac, Mich.  
Gramm Motors, Inc., Lima, Ohio  
Hug Co., The Highland, Ill.  
Indiana Truck Corp., Marion, Ind.  
La France-Republic Sales Corp., New York  
Larabee-Deyo Motor Truck Co., Binghamton, N. Y.  
Luedinghaus-Espenschied Wagon Co., St. Louis  
Maccar Truck Co., Seranton, Pa.  
Mack Trucks, Inc., New York  
Moreland Motor Truck Co., Los Angeles, Calif.  
Pierce-Arrow Motor Car Co., Buffalo, N. Y.  
Rehberger & Son, Newark, N. J.  
Relay Motors Corp., Lima, Ohio  
Reo Motor Car Co., Lansing, Mich.  
Schacht Motor Truck Co., Cincinnati, Ohio  
Selden Truck Corp., Rochester, N. Y.  
Standard Motor Truck Co., Detroit, Mich.  
Sterling Motor Truck Co., Milwaukee  
Stewart Motor Corp., Buffalo, N. Y.  
Studebaker Corp., South Bend, Ind.  
Traffic Motor Truck Co., St. Louis, Mo.  
Walter Motor Truck Co., Long Is. City, N. Y.

## Turntables, Motor Truck

\*Blaw-Knox Co., Pittsburgh, Pa.  
Canton Fdy. & Mach. Co., Canton, Ohio  
Champion Engine Co., Kenton, Ohio  
Easton Car & Const. Co., Easton, Pa.  
Hug Co., Highland, Ill.  
Western Structural Co., Moline, Ill.  
Whiting Corp., Harvey, Ill.

## Underground Conduits (See Conduits)

## Unloaders, Car

\*Burch Corp., Crestline, Ohio  
\*Heitzel Steel Form & Iron Co., Warren, Ohio  
Atlas Engg. Co., Clintonville, Wis.  
Hains Mfg. Co., Geo., New York  
Northern Conveyor Co., Janesville, Wis.  
Portable Machinery Co., Clifton, N. J.  
Universal Road Machy. Co., Kingston, N. Y.  
Webster & Weller Mfg. Co's, Chicago

## Valves, Check

Chapman Valve Mfg. Co., Indian Orch., Mass.  
Coffin Valve Co., Boston, Mass.  
Cook, Inc., A. D., Lawrenceburg, Ind.  
Darling Valve Mfg. Co., Williamsport, Pa.  
Kennedy Valve Mfg. Co., Elmira, N. Y.  
Ludlow Valve Mfg. Co., Troy, Ohio  
Michigan Valve & Fdy. Co., Detroit, Mich.  
Rensselaer Valve Co., Troy, N. Y.

## Valves, Gasoline Engine

Industrial Engine Parts Co., Inc., Cleveland

## Valves, Relief

\*Nippon Meter Co., New York  
Crane Co., Chicago, Ill.  
Davis Regulator Co., Chicago  
Eddy Valve Co., Watford, N. Y.  
Golden-Anderson Valve Spec. Co., Pittsburgh  
Ludlow Valve Mfg. Co., Troy, N. Y.  
Mueller Co., Decatur, Ill.  
Ross Valve Mfg. Troy, N. Y.  
Simplex Valve & Meter Co., Philadelphia

## Wagons, Dump, Horse-Drawn

\*Austin-Western Rd. Machy. Co., Chicago  
\*Highway Trailer Co., Edgerton, Wis.  
\*Hvass & Co., Chas., New York  
Acme Road Machy. Co., Frankfort, N. Y.  
Acme Wagon Co., Emigsville, Pa.  
Adams Co., J. D., Indianapolis, Ind.  
Eagle Wagon Works, Auburn, N. Y.  
Holzbog & Bro., G. H., Jeffersonville, Ind.  
Luedinghaus-Espenschied Wagon Co., St. Louis  
Streich & Bro. Co., A., Oshkosh, Wis.  
Stroud Rd. Machy. Co., Omaha, Neb.  
Troy Trailer & Wagon Co., Troy, Ohio  
Western Wheeled Scraper Co., Aurora, Ill.

## Wagons, Dump, Tractor-Drawn

\*Electric Wheel Co., Quincy, Ill.  
\*Euclid Crane & Hoist Co., Euclid, Ohio  
Acme Road Machy. Co., Frankfort, N. Y.  
Athey Truss Wheel Co., Chicago  
Biehl Iron Works, Reading, Pa.  
Davenport Loco. & Mfg. Corp., Davenport, Iowa  
Eagle Wagon Works, Auburn, N. Y.  
LaPlant-Choute Mfg. Co., Cedar Rapids, Ia.  
Lenhart Wagon Co., Minneapolis, Minn.  
LeTourneau, R. G., Stockton, Calif.  
Smith Trailer Corp., Syracuse, N. Y.  
Streich & Bro. Co., A., Oshkosh, Wis.  
Trail-IT Co., St. Paul, Minn.  
Troy Trailer & Wagon Co., Troy, Ohio  
Western Wheeled Scraper Co., Aurora, Ill.  
Winnor Tractor Equip. Corp., Ann Arbor, Mich.

## Wall Ties (See Ties)

## Washers, Sand and Gravel

\*Good Roads Machy. Co., Kennett Square, Pa.  
\*Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
\*Pioneer Gravel Equip. Mfg. Co., Minneapolis.  
Iowa Mfg. Co., Cedar Rapids, Iowa  
Jeffrey Mfg. Co., Columbus, Ohio  
Link-Belt Co., Chicago, Ill.  
New England Road Machy. Co., South Boston, Mass.  
New Holland Machine Co., New Holland, Pa.  
Rogers Iron Wks. Co., Joplin, Mo.  
Smith Engineering Works, Milwaukee, Wis.  
Stephens-Adams Mfg. Co., Aurora, Ill.  
Traylor Engg. & Mfg. Co., Allentown, Pa.  
Universal Rd. Machy. Co., Kingston, N. Y.  
Weimer Co., H. W., Milwaukee, Wis.

## Water Hose Couplings (See Couplings)

## Waterproofing

\*Acqua-Pruf, Inc., New York  
\*Barrett Co., New York  
\*Carey Co., Philip, Cincinnati, Ohio  
\*Meadows, Inc., W. E., Stretor, Ill.  
\*Servicised Premoulded Products, Chicago  
American Sika Corp., New York  
Anti-Hydro Waterproofing Co., Newark, N. J.  
Atlas Mineral Prod. Co., Meritown, Pa.  
Barber Asphalt Co., Philadelphia  
Bitutect, Inc., Los Angeles, Calif.  
Headley Emulsified Prod. Co., Philadelphia  
Johns-Manville Co., New York  
Lehon Co., Chicago  
Master Builders Co., Cleveland, Ohio  
Medusa Portland Cement Co., Cleveland, Ohio  
Minwax Co., New York  
Ruberoid Co., New York  
Sonneborn Sons, Inc., L., New York  
Texas Company, New York  
Toch Brothers, New York  
Truscon Laboratories, Detroit, Mich.  
Western Elastite Roofing Co., Denver, Colo.

## Welding Apparatus, Acetylene

Imperial Brass Mfg. Co., Chicago  
Macleod Co., Cincinnati, Ohio  
Milburn Co., Alex., Baltimore, Md.  
Oxweld Acetylene Co., L. I. City, N. Y.  
Smith Welding Equip. Corp., Minneapolis

## Welding Apparatus, Electric

Acme Electric Welder Co., Los Angeles, Calif.  
Burke Electric Co., Erie, Pa.  
Eisler Electric Corp., Newark, N. J.  
Fusion Welding Corp., Chicago  
General Electric Co., Schenectady, N. Y.  
Klauser Mfg. Co., Dubuque, Iowa  
Lincoln Electric Co., Cleveland, Ohio  
Northwestern Mfg. Co., Milwaukee, Wis.  
Stoody Co., Whittier, Calif.  
Syntroon Co., Pittsburgh, Pa.  
U. S. Light & Heat Corp., Niagara Falls, N. Y.  
Westinghouse E. & M. Co., E. Pittsburgh, Pa.

## Well Drills (See Drills)

## Well Points

Cook, Inc., A. D., Lawrenceburg, Ind.  
Johnson, Inc., E. E., St. Paul, Minn.  
Moore Trench Machine Co., Rockaway, N. J.

## Wheelbarrows

\*Lansing Co., Lansing, Mich.  
Acme Road Machinery Co., Frankfort, N. Y.

American Steel Scraper Co., Sidney, Ohio  
Asheboro Wheelbarrow Co., Asheboro, N. C.  
Case Crane & Eng. Co., Columbus, Ohio  
Chattanooga Wheelbarrow Co., Chattanooga, Tenn.

Fairbanks Co., New York  
Jackson Mfg. Co., Harrisburg, Pa.  
Puffer-Hubbard Mfg. Co., Minneapolis, Minn.  
Red Star Products Corp., Cleveland, Ohio  
Sidney Steel Scraper Co., Sidney, Ohio  
Sterling Wheelbarrow Co., Milwaukee, Wis.  
Stuebner Iron Wks., Inc., G. L., Long Island City, N. Y.  
Toledo Wheelbarrow Co., Toledo, Ohio

## Wheeled Scrapers (See Scrapers)

## Wheels, Steel

\*Electric Wheel Co., Quincy, Ill.  
\*Lansing Co., Lansing, Mich.  
Buda Co., Harvey, Ill.  
Fairbanks, Morse & Co., Chicago  
Wehr Co., Milwaukee, Wis.  
Whitehead & Kales Co., Detroit, Mich.

## Winches

\*Beebe Bros., Inc., Seattle, Wash.  
\*Clyde Iron Works Sales Co., Duluth, Minn.  
\*Dake Engine Co., Grand Haven, Mich.  
\*Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.  
\*Lidgerwood Mfg. Co., Elizabeth, N. J.  
\*Mundy Hoisting Eng. Co., J. S., Newark, N. J.  
\*Saggen Derrick Co., Chicago  
\*Schaefer Co., Gustav, Cleveland, Ohio  
\*Street Bros. Mach. Works, Chattanooga, Tenn.  
Chicago Pneumatic Tool Co., New York  
Chisholm-Moore Hoist Corp., Tonawanda, N. Y.  
Fridy Hoist & Machy. Co., Mountville, Pa.  
Horton Co., John T., New York  
Mead-Morrison Mfg. Co., E. Boston, Mass.  
Muskegee Iron Works, Muskogee, Okla.  
Stephens-Adams Mfg. Co., Aurora, Ill.  
Sullivan Machinery Co., Chicago  
Thomas Elevator Co., Chicago  
Willamette-Ersted Co., Portland, Ore.

## Wire and Cable, Electric

\*American Steel & Wire Co., Chicago  
Anacosta Wire & Cable Co., Pawtucket, R. I.  
Bishop Wire & Cable Corp., New York  
Copperweld Steel Co., Glassport, Pa.  
General Cable Corp., New York  
General Electric Co., Schenectady, N. Y.  
Graybar Electric Co., New York  
Habirshaw Cable & Wire Corp., New York  
Marion Insulated Wire & Rubber Co., Chicago  
New York Insulated Wire Co., New York  
Okonite Co., Passaic, N. J.  
Page Steel & Wire Co., Bridgeport, Conn.  
Roebling's Sons Co., John A., Trenton, N. J.  
Rome Wire Co., Rome, N. Y.  
Simplex Wire & Cable Co., Boston, Mass.  
Standard Underground Cable Co., Pittsburgh  
Wickwire-Spencer Steel Co., New York

## Wire Cutters (See Cutters)

## Wire Fabric Reinforcing for Concrete

\*American Steel & Wire Co., Chicago  
\*Truscon Steel Co., Youngstown, Ohio  
Consolidated Exp. Metal Co., Wheeling, W. Va.  
Electric Welding Co., Pittsburgh, Pa.  
Kahnman Steel Co., Chicago, Ill.  
National Steel Fabric Co., Pittsburgh, Pa.  
Wickwire-Spencer Steel Co., New York

## Wire Fence (See Fence)

## Wire Rope (See Rope)

## Wire Rope Clips (See Clips)

## Wood, Creosoted

American Creos. Co., Inc., Louisville, Ky.  
American Creos. Wks., Inc., New Orleans, La.  
Ayer & Lord Tie Co., Chicago  
Colonial Creos. Co., Inc., Louisville, Ky.  
Compressed Wood Preserv. Co., Cincinnati, O.  
Creosoted Materials Co., New Orleans, La.  
Georgia Creos. Co., Louisville, Ky.  
Jennison-Wright Co., Toledo, Ohio  
Long Bell Lumber Co., Kansas City, Mo.  
Midland Creos. Co., Granite City, Ill.  
Pensacola Creos. Co., Pensacola, Fla.  
Republic Creos. Co., Indianapolis, Ind.  
Southern Wood Preserving Co., Atlanta, Ga.  
Wyeckoff Pipe & Creos. Co., New York

## Wood Block Paving (See Block Paving)

## Wood Pipe (See Pipe)

## Wood Tanks (See Tanks)

## Woodworking Machines, Portable

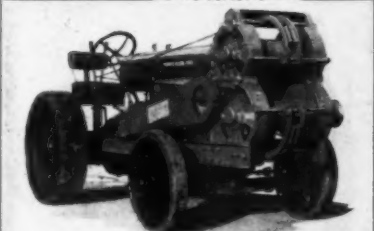
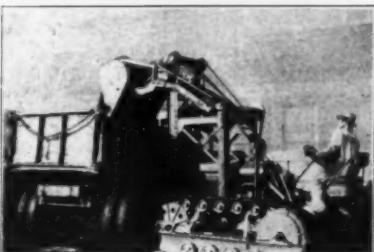
\*American Saw Mill Machy. Co., Hackettstown, N. J.  
\*C. H. & E. Mfg. Co., Milwaukee, Wis.  
Black Bros. Co., Mendota, Ill.  
Carter Co., R. L., Phoenix, N. Y.  
Jaeger Portable Power Corp., Detroit, Mich.  
Jones Superior Machine Co., Chicago  
Master Woodworker Mfg. Co., Detroit, Mich.

## Wrought Iron Pipe (See Pipe)

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover \*



# POWER FOR PROFIT



**L**OWER COSTS in road building and contracting during the new year are going to require something more than the usual good equipment. Equipment will have to be not only good but widely adaptable — suited to the greatest number of different jobs. After a machine, let us say a bulldozer, has done its usual work, it will have to drop that attachment and keep on going with some other.

■ That will be an easy matter for such Trackson Equipment as bulldozers, shovels, trench rollers, etc., for each uses the same hoisting assembly and is therefore interchangeable with the other. On many operations one Trackson Crawler Tractor with two or more of these attachments is essentially the equal of the same number of complete units. The short time required for change-over is negligible compared to the saving effected thru lower investment, less depreciation and the continuous use of one machine.

■ All Trackson Equipment has been designed with this utility end in view. The crawlers have been designed to provide plenty of room for the easy and secure attachment of equipment. No matter which attachment is used the drawbar is always available for duty. Let us suggest the combination of equipment that will bring you lowest costs. Trackson Company, 1323 So. First St., Milwaukee, Wis.

ROAD SHOW BOOTH A-27

## TRACKSON

TRACTOR EQUIPMENT



# All Contractors know this

The ability of Blaw-Knox to design, build and continually improve this *complete line* of Contractors' Equipment is gained through twenty-five years of close contact with construction jobs.

**Blaw-Knox Equipment is *dependable*—  
It is properly *serviced*—it is *profitable* to use.**

Visit  
Blaw-Knox  
at the  
**ROAD  
SHOW**



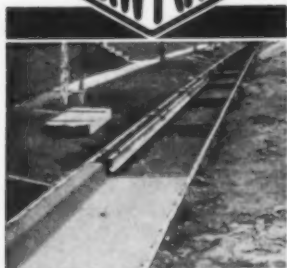
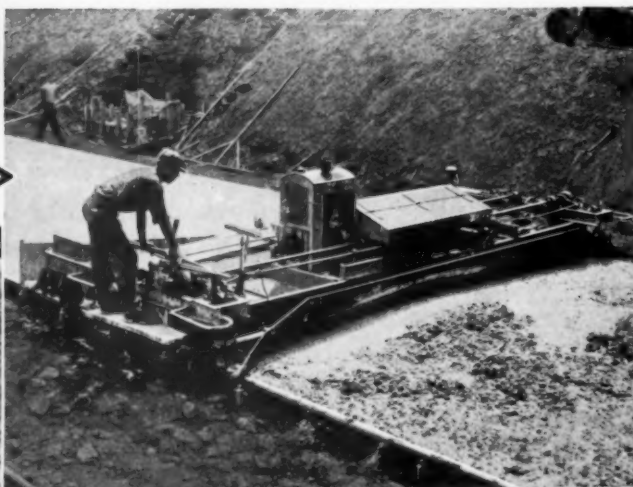
## BLAW-KNOX COMPANY

2067 FARMERS BANK BLDG., PITTSBURGH, PA.  
NEW YORK PHILADELPHIA CLEVELAND CHICAGO  
BIRMINGHAM BALTIMORE DETROIT BUFFALO BOSTON

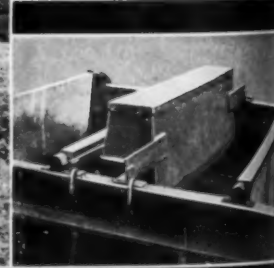
### EXPORT DIVISION

BLAW-KNOX INTERNATIONAL CORPORATION  
CANADIAN PACIFIC BLDG., NEW YORK, N. Y.

LONDON, ENGLAND, NEW OXFORD HOUSE, HART ST., HOLBORN, W. C. 1.  
PARIS, FRANCE, 1 RUE DE CLICHY  
MILAN, ITALY, 6 VIA S. AGNESE, 6  
DUSSELDORF, GERMANY, 17 BISMARCKSTRASSE



Street & Sidewalk Forms



The Cementank



Weighing Batches



Agitator Truck Bodies



Clamshell Buckets - Draglines



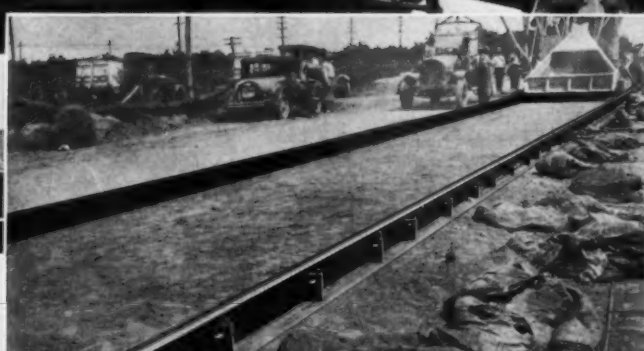
Truck Turntables

Please mention the CONTRACTORS AND ENGINEERS MONTHLY—it helps.

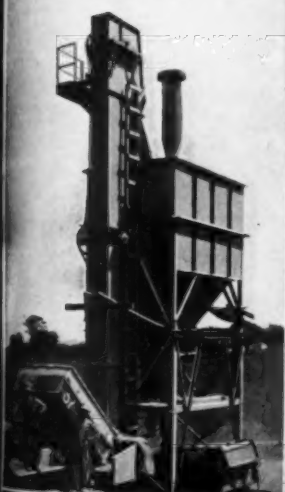
# DEPENDABILITY



Batcher plants



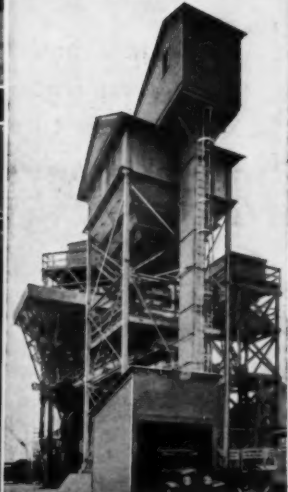
ROAD FORMS—once set they stay set



Bulk Cement Plants



WAGON GRADERS—dig, load, haul, dump & spread



Ready Mixed Concrete Plants

When writing to advertisers please mention the CONTRACTORS AND ENGINEERS MONTHLY—Thank You.

•

# POWER ECONOMY PERFORMANCE!

•

An Allis-Chalmers "75" with heavy duty grader and a "50" with rotary scraper, on a road job in Minnesota.



Visit our display at the Road Show in St. Louis, Jan. 12 to 16, 1931.

Men who have driven all makes of tractors write letters about the "Allis-Chalmers Track-Type" in which they say . . . "the finest piece of machinery I ever took care of" . . . "more power than in any tractor of its size" . . . "easiest handling and steering and doesn't tire you out after a long day's work."

Write for descriptive literature and the name of your nearest Allis-Chalmers dealer.

Monarch '35', '50' and '75' Track-type tractors, Model 'U' Wheel-type tractors.

**ALLIS-CHALMERS MANUFACTURING COMPANY**

Industrial Tractor Division, Springfield, Ill.

Specialists in Power Machinery Since 1846

General Offices, Milwaukee, Wis.

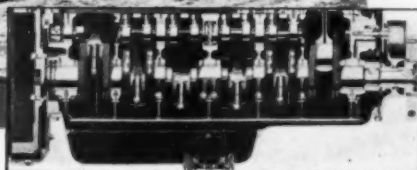
**Allis**  **Chalmers**  
**TRACTOR POWER FOR EVERY PURPOSE**

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.





Cross section showing crankshaft, connecting rods and bearing caps, pressure feed lubrication system gear.



## KEEPING

## THE PROFITS IN THE CONTRACT JOB

*Above is shown one of a fleet of five-and-one-half cubic yard dump trucks used in California road building. These big six-wheel trucks powered with Continental heavy duty 16H Engines will operate continuously at full capacity for twelve and sixteen hours a day. With Continental powered trucks shovels are never kept idle.*

The heavy duty Continental 16H Engines are built with 3 inch seven bearing crankshafts, aluminum alloy five ring pistons, steel drop forged connecting rods, and protected by gear-driven pressure feed lubrication. Specify Continental—and you have your guarantee of the best in materials, machining, design and construction.

CONTINENTAL MOTORS CORPORATION  
INDUSTRIAL EQUIPMENT DIVISION

Office and Factory: Muskegon, Michigan  
The Largest Exclusive Gasoline Motor Manufacturer in the World

See Our Exhibit at the Road Show, St. Louis



# ***Continental Engines***

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

# EUCLID

## EARTH MOVING EQUIPMENT



**WE** illustrate a few typical examples of Euclid "Track-Wheel" Wagons and other Euclid equipment at work. They tell their own story of dependability and economical operation.



When writing to advertisers please mention the CONTRACTORS AND ENGINEERS MONTHLY—Thank You.

**H**UNDREDS of Contractors are realizing profits with *Euclid* Equipment on construction jobs, where earth moving is a big factor.

The complete line of *Euclid* "Track-Wheel" Wagons, Scrapers, Bulldozers, etc., offers the Contractor a full range of heavy duty, dependable earth moving equipment.

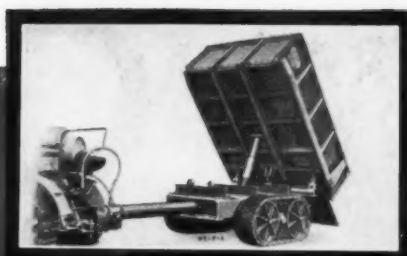
If you want fair weather profits under all conditions, and through all seasons, put *Euclid* Equipment to work on your job.

## The EUCLID

**Crane & Hoist Co.**

**CLEVELAND, OHIO**

CHARDON ROAD



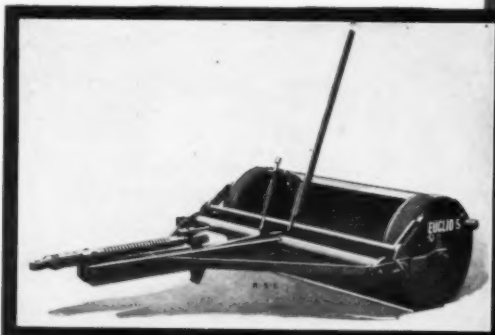
Euclid  
"Track-Wheel"  
Hydraulic  
End Dump  
Wagon



Above  
Euclid  
"Track-Wheel"  
Bottom Dump  
Wagon



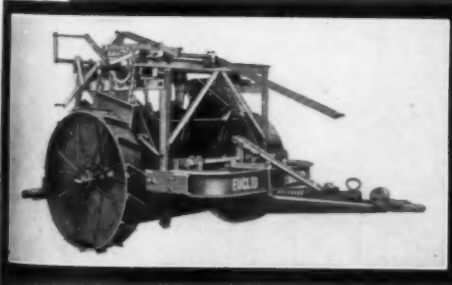
Left  
Euclid  
"Track-Wheel"  
Gravity Dump  
Wagon



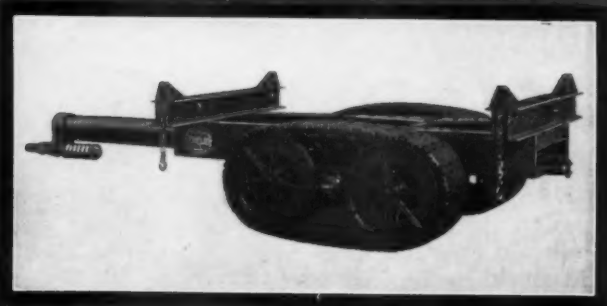
Above  
Euclid  
Automatic  
Rotary  
Scraper



Over  
Euclid  
Hydraulic  
Bulldozer



Left  
Euclid Automatic  
Wheel Scraper



Euclid  
"Track-Wheel"  
Pipe and Log  
Wagon

**CLETRAC**  
 **????**  
 To be announced  
 at the Road Show

**CLETRAC**  
**TWENTY**

**CLETRAC**  
**FORTY-**  
**THIRTY** 

**CLETRAC**  
**FORTY**

**CLETRAC**  
**EIGHTY-SIXTY**

## At the ROAD SHOW

you will find the Cletrac Exhibit in Building "A" in adjoining spaces 24 and 44, January 12 to 16, at St. Louis.

# C L E C R A W L

**N**EVER before in a single tractor line has there been offered so extensive an array of industrial power units as you find in the 1931 Cletrac line-up. With a power range up to a maximum delivery of 80 h.p. in the big 80-60, the line meets fully every power need in road and general contract work. Up-to-the-minute in every mechanical detail — rugged as tough steels and sound design can make them — dependably powered with the most modern of tractor motors — these Cletracs offer unquestionably the greatest values from which to select your 1931 tractor equipment.

- Automatic lubrication on all models
- Exclusive, patented planetary gear steering
- Remarkably low oil and gas consumption

See the Cletrac full line exhibit at the ROAD SHOW. The new smaller Cletrac with its marked advantages for small horsepower jobs — the new Cletrac "40-30" with its trim lines and superb performance — the Cletrac "20" — the old, trusty "40" — the incomparable "80-60" — all of these will be there to give you at first hand a complete picture of how Cletrac can serve you.

*Literature on any or all models  
will be mailed on request.*

**The Cleveland Tractor Company**  
 19321 Euclid Avenue  
 Cleveland, Ohio

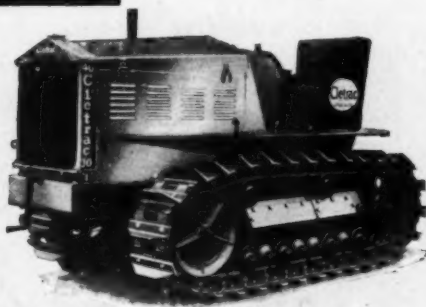


# ETRAC

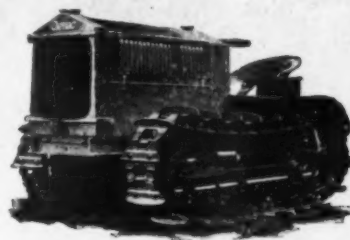
## ER TRACTORS



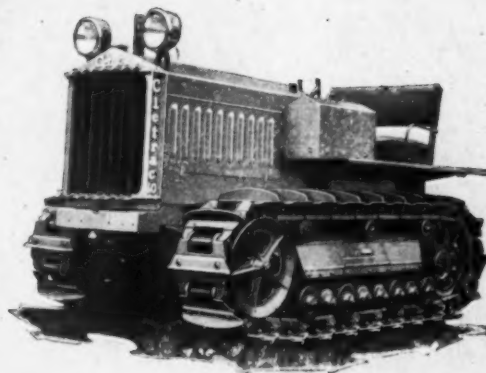
The **????**  
**NEW!**



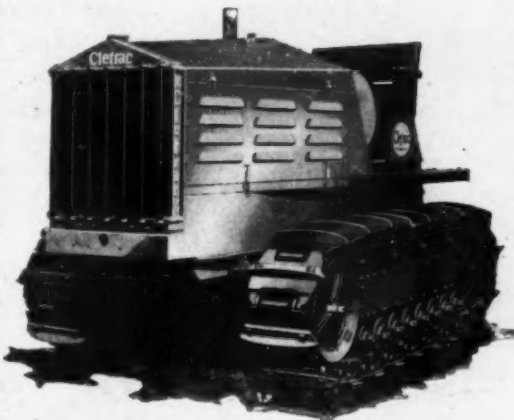
The **FORTY-THIRTY**  
**NEW!**



The **TWENTY**



The **FORTY**



The **EIGHTY-SIXTY**

**Known, used,  
approved  
across the  
world:**

Homelite Portable  
3-in. Self Priming  
Centrifugal Pump  
with built-in 1 1/2  
hp. Homelite air-  
cooled gasoline  
engine. Capacity  
up to 6000 gal.  
per hr. Weight  
complete 90 lbs.  
\$225 f.o.b. Port  
Chester.

Homelite 1 1/2-in.  
Portable Self  
Priming Centrif-  
ugal Pump  
with 1 1/2 hp. Gen-  
eral Electric  
Motor. Capacity  
35,000 gal. per  
hr. \$450 f.o.b.  
Port Chester.

Homelite 4-in.  
Portable Self  
Priming Cen-  
trifugal Pump  
powered by  
8-10 hp. gas-  
oline engine  
Capacity  
per hr. \$480  
f.o.b. Port  
Chester.

Homelite 2-in.  
Self Priming Cen-  
trifugal Pump  
with 1 1/2 hp. 3 hp.  
General Electric  
Motor. Capacity  
up to 7500 gal.  
per hr. Weight  
complete 55 lbs.  
\$250 f.o.b. Port Chester.

Homelite Portable  
Generator with  
built-in 1 1/2 hp.  
Homelite air-cooled  
gasoline engine.  
1 1/2 kw. 500  
watts D.C. Weight  
complete 100 lbs.  
\$235 f.o.b. Port  
Chester.  
32 volt, 250 watts,  
D.C. with 20 amp.  
hr. storage battery  
\$475 f.o.b. Port  
Chester.

Homelite Port-  
able Blower  
with built-in  
1 1/2 hp. Hom-  
elite air-cooled  
gasoline engine.  
Capacity 3000  
cu. ft. air per  
minute.  
Weight, com-  
plete 75 lbs.  
\$195 f.o.b.  
Port Chester.

## HOMELITE Portable Equipment

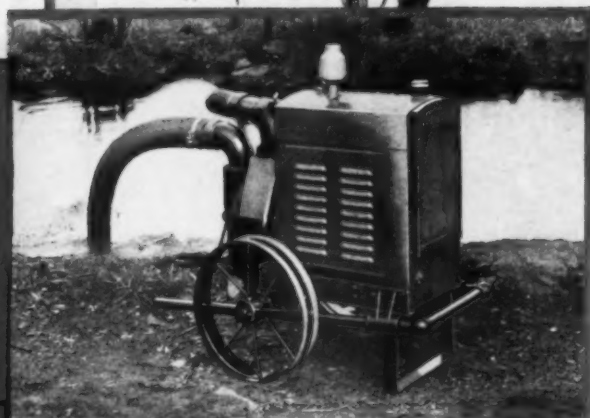
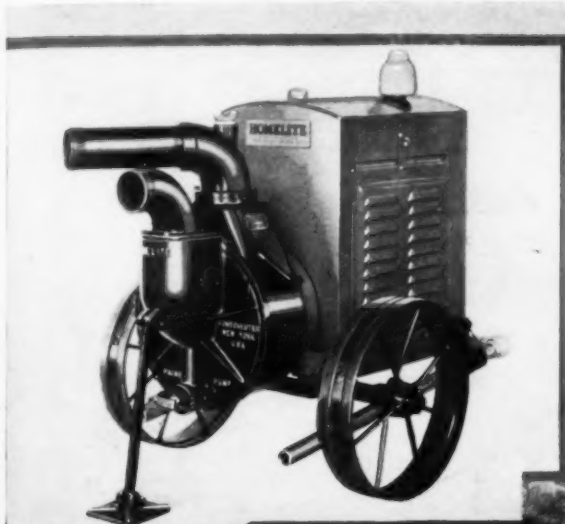
Homelite Self Priming Centrifugal Pumps require no auxiliary vacuum apparatus, no foot valves, no adjustment when changing from volume to seepage or vice versa. Bronze open-type impeller, oversize ball bearings. Handle muddy, gritty water, heavy liquids, stand the gaff of outdoor use.

Homelite Blowers, air compressors, generators also are built for dependable, strenuous service.

Distributors all over the world for demon-  
stration and service. Write for address of  
the nearest

# HOMELITE

HOMELITE CORPORATION  
71 Riverdale Avenue, Port Chester, N. Y.



# 4" Self- Priming Homelite Portable Centrifugal Pump

**Homelite Facts  
that get home**  
Self Priming—no foot valve.  
No vacuum auxiliaries of any  
kind. Capacity 25,000 gal. per  
hr. Suction lift 20 feet. Pow-  
ered by LeRoi 8-10 H. P., 4 cyl-  
inder gasoline engine. Bronze  
open type impeller. Handle  
telescopes into frame when  
not in use. Weights 730 lbs.

**\$480**

F. O. B. Port Chester, N. Y.

**HOMELITE CORPORATION**

71 Riverdale Avenue, Port Chester, New York

*Distributors all over the world for demonstration  
and service*

## HOMELITE

**1" and 2" Portable Self-Priming Centrifugal Pumps**

**Also Portable Blowers, Air Compressors, Electric Generators — all powered by Homelite Air-Cooled Engines**

⊕ 5236





## MAKE MORE MONEY IN 1931 with New White 6-cylinder Heavy Duty Trucks . .

**R**UGGED, powerful and dependable the new medium heavy duty and heavy duty six-cylinder White Trucks enable contractors to maintain maximum output in road construction and maintenance work.

White Truck dependability insures the road contractor against costly delays. The ability of Whites to maintain fast schedules, coupled with extreme low cost of operation, increases the contractor's margin of profit.

The new White Six-cylinder Trucks are

modern in every detail. They are correctly designed and built to give years of dependable service.

DEPENDABILITY OF MOTOR EQUIPMENT IS OF VITAL IMPORTANCE, BECAUSE THE LACK OF IT IS EXCEEDINGLY COSTLY.

***Lower your construction costs and increase your profits  
by using dependable White Truck equipment.***

SEE THE WHITE TRUCK EXHIBIT AT THE GOOD ROADS SHOW

**THE WHITE COMPANY, Cleveland**

# WHITE TRUCKS

**FOURS and SIXES**



## Write For Catalogs

**K** NOW these N.E.C. road building units — what N.E.C. standards of engineering, construction and service mean to greater road building profits.

**KOEHRING AUTOCYCLE PAVER** — accurately timed automatic actions from raising of skip to discharge of "dominant strength" concrete! The fast Heavy Duty paving unit!

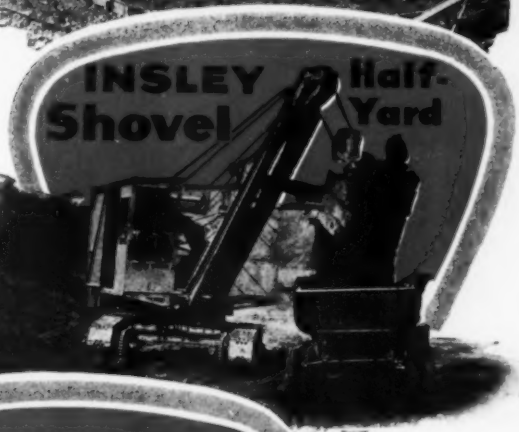
**KOEHRING SHOVELS** — capacities rated on line-of-plate "struck" measure — the "heap" is extra pay dirt! Crowds above and beyond end of boom! Full power behind either hoist or crowd. Cuts down "nibbling." The Heavy Duty Shovel.

**HALF-YARD INSLEY SHOVEL** — fast, right or left steering, fast-swinging half-yard excavator, not the lowest in price but the outstanding value in its class.

**SMITH PAVER** — fast placement of concrete on the subgrade. Strong dependable construction — a great value.

**C.H.&E. ROAD PUMP** — 80 gallons per minute up to 5 miles; 70 gallons per minute up to 7 miles.

N.E.C. service everywhere. Make sure of greatest possible profits by using N.E.C. equipment. Write for catalogs.



# National Equipment Corporation



*Milwaukee*

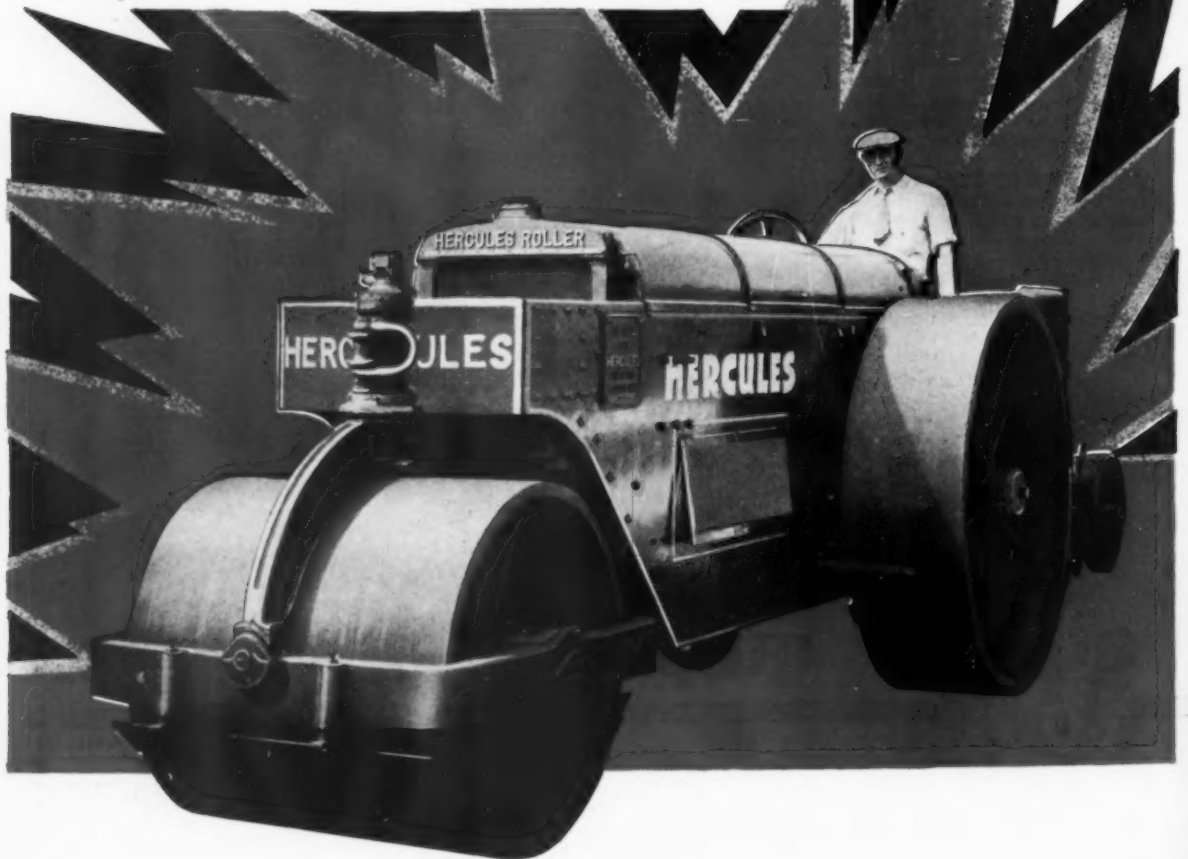
A 6162-I-C

# HERCULES ROLLERS

**SOLD ONLY THROUGH DISTRIBUTORS**

With the presentation at the 1931 St. Louis Road Show of Hercules Models 60, 80, 100 and 120, Hercules offers a complete line of road rollers built to profitably handle any job. Hercules Rollers have won approval. You cannot buy any better—or as good. Don't miss Hercules Booth No. B-51.

**THE HERCULES COMPANY - MARION, OHIO.**



Please mention the CONTRACTORS AND ENGINEERS MONTHLY—it helps.



# THE COMPLETE SCHRAMM COMPRESSOR LINE

SERVES EVERY

## Air Use

Because the "SCHRAMM" organization has specialized, for thirty years, in the efficient, economical and convenient production of Compressed Air, it has also, for thirty years, been a leader in the development and modification of air producing equipment and pneumatic tools. The "SCHRAMM" line therefore, is complete in every respect—there is a compressor and there are tools for every kind of air job in any location. There are portable and stationary engine-driven units built in sizes that cover almost any requirement in the construction field, from the largest to the smallest job—stationary belt- and motor-driven compressors, either direct-connected, or equipped with idler for short belt drive, tank mounted and various other combinations.

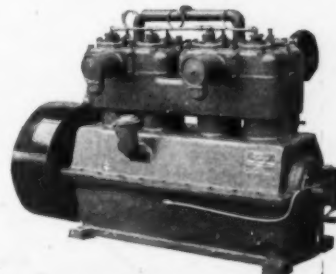
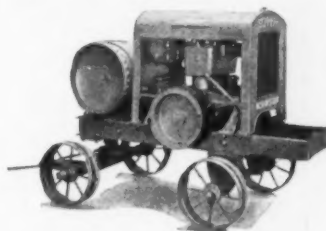
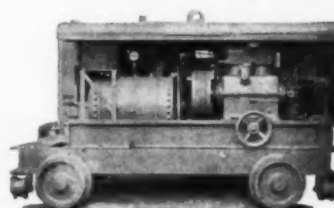
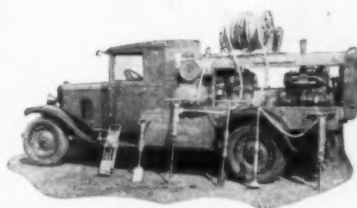
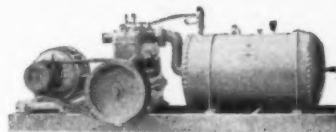
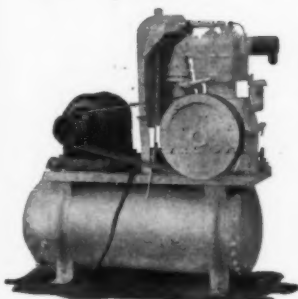
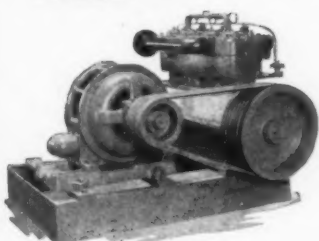
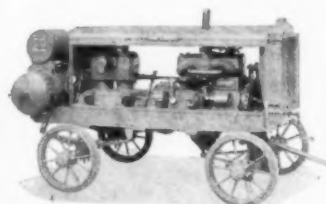
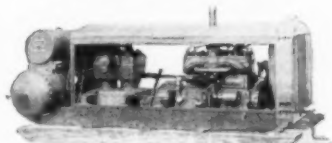
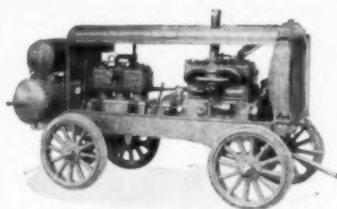
*Complete specifications, descriptions and recommended uses of any "SCHRAMM" equipment are available at any time.*

Prices on application to nearest dealer or to

**SCHRAMM, INC.**  
WEST CHESTER, PENNA.

NEW YORK  
PHILADELPHIA  
PITTSBURGH  
TULSA  
SAN FRANCISCO

CHICAGO  
BOSTON  
CLEVELAND  
BIRMINGHAM  
DETROIT



# Roads



## ON THE NATION'S HIGHWAYS ~ ~

When there's a road job to be done, you'll find that nothing compares with an Osgood. It pushes its way through the toughest spots—a glutton for work—a record breaking performer that packs a mighty crowd. An Osgood craves action—at a moment's notice it is ready for fast, powerful digging—ready to match its unlimited power and strength against any job. Put an Osgood on your road job—it will do more work in less time and earn you more profits.

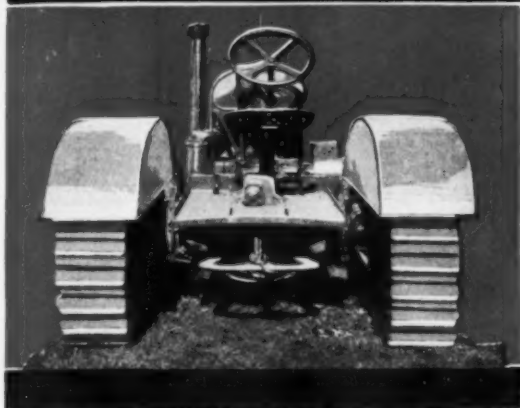
THE **OSGOOD** CO.  
MARION OHIO



*Osgood*  
for  
**ALL  
JOBS**

ROADS  
DRAINAGE  
GRADING  
STREETS  
BUILDING  
SEWERS  
BRIDGES  
SAND and GRAVEL  
RAILROADS  
TUNNELS  
BRICK and CLAY  
INDUSTRIAL  
SUBWAYS  
TRENCHES  
MINING  
LOGGING  
DOCKS  
STONE  
DREDGING  
DAMS  
QUARRIES  
MATERIAL YARDS  
AND MANY MORE

# POSITIVE TRACTION..



Proved Performance  
with

## MOON TRACKS

**M**OON TRACKS materially increase the draw-bar pull of wheel tractors at every stage of the highway industry — construction — maintenance and snow removal. This new semi-crawler principle delivers all the engine power at the draw-bar all the time. Free individual track oscillation keeps each track continuously in full contact with the ground.

Moon Track-equipped tractors pull elevating graders, scrapers, scarifiers and trailers — they push snow plows, bulldozers and back-fillers — they operate winches, power shovels, stump pullers and many other pieces of equipment—all at reduced operating costs.

Rough going, embankments, and steep obstacles of any sort in the road or fill are all the same to Moon Track-equipped tractors. Their positive traction assures completing the job.

Moon Tracks are supplied with new tractors or for tractors now in use. Equip your tractors with them for best performance.

*See the Moon Track Exhibit in Booth  
A-31 at the Road Show, St. Louis,  
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## MOON TRACK COMPANY

Dept. C. E.  
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CHICAGO ILLINOIS



MOON TRACKS  
are available  
for McCormick-Deering,  
Allis-Chalmers and  
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*South Willard Street, Burlington, Vt., paved  
with Standard Refined Paving Asphalt.*

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### SOCONY BRAND

Standard Asphalt Binder A  
*for surface treatment*

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*for penetration work*

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*for the mixing method*

Standard Asphalt Joint Fillers  
*for brick or block pavements*

Standard Cold Patch Asphalt  
*for repairing all types of  
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Standard Refined Asphalt  
*for sheet asphalt paving*

Standard Paving Flux  
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*Specifications and all other particulars  
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# Rugged-Reliable

**Schaefer**  
CLEVELAND

## One-Man Automatic Tractor Scraper



### Does Accurate Work

Nearly ten thousand in use, the world over, for developing roads, parks, cemeteries, golf and airplane landing fields, digging cellars, grading around new schools, laying-out allotments, filling trenches, etc.

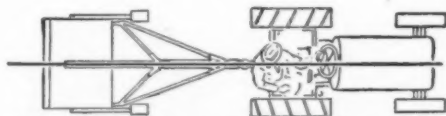
This good earth moving tool is—

**Labor-saving** (one-man-operated)

**Handy and easy to run** (loading and dumping, spreading and leveling, are all handled from the driver's seat—and there's nothing to regulate, oil or adjust)

**Low in upkeep cost** (wearing parts are few and easy to replace)

Four sizes: scraper widths, 4, 5, 6, 7 feet



KEEPS TRACTOR AND SCRAPER IN LINE

The new Auxiliary Back-Up Control is handy for Short Hauls, for Excavating and for Back-Filling. It operates the scraper back-and-forth like a shuttle. It's not necessary to turn the tractor around. Action is automatic. Requires no levers.

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Established 1880

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USE  
**RED**  
No other color means  
DANGER

## Dietz Lanterns Stay Lighted



**Y**OU need Dietz Red Lanterns—lanterns that can be left on road construction at night with confidence that they will be found burning in the morning—whatever the weather may be.



The ultimate difference in cost between a scientifically correct Dietz Lantern and something less reliable might be thousands of dollars in case of accident.

For economy and utmost safeguard use Dietz Red Lanterns for night warning duty.

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Largest Makers of Lanterns in the World

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**DIETZ**  
LANTERNS

# 24



ACQUA-PRUF speeded the setting of this road

Especially the one where Old Army Road crossed Dudley Road at right angles and a residential outlet street entered at an odd angle, where it was necessary to open the pavement within 24 hours. At this intersection and other places where it was equally urgent to open the pavement quickly, Acqua-Pruf was used. This admixture which is a liquid made it not only possible to open the pavement to heavy traffic within 24 hours, but also acted as a waterproofing agent and has the property of preventing oil drippings from automobiles from staining the concrete, as they are readily washed off by rain.

Private driveway entrances were closed for 24 hours and then bridged. No admixture was used at these points, as it would have necessitated the use of the mixer for practically the entire length of the job.

Bitum  
excess  
a distar  
Road at  
because

Clipping from an article in **CONTRACTORS AND ENGINEERS MONTHLY**  
—December, 1929

**What ACQUA-PRUF did on this job, it can do on yours:**  
The clipping and illustration are from an article in **Contractors and Engineers Monthly** describing a concrete paving job made ready for traffic within 24 hours by the use of ACQUA-PRUF.  
**Quick set:**—One quart of ACQUA-PRUF to a bag of Portland Cement has by test produced a compressive strength 50 per cent in excess of untreated concrete—enabling walks, paving, etc., to be opened to traffic in 24 hours.

**Waterproofing:**—As an integral waterproofer ACQUA-PRUF cannot be excelled.  
**Anti-freeze:**—ACQUA-PRUF-treated concrete can be poured at temperatures as low as ten degrees above zero.

**Ultimate strength:**—At the end of three-year periods, tests show that ACQUA-PRUF-treated concrete still retains its lead in both compressive and tensile strength.

**ACQUA-PRUF INCORPORATED**  
393 Seventh Avenue  
New York





# SIGNS OF WELCOME

GREETING YOU AS YOU ENTER THE  
ARENA AT THE

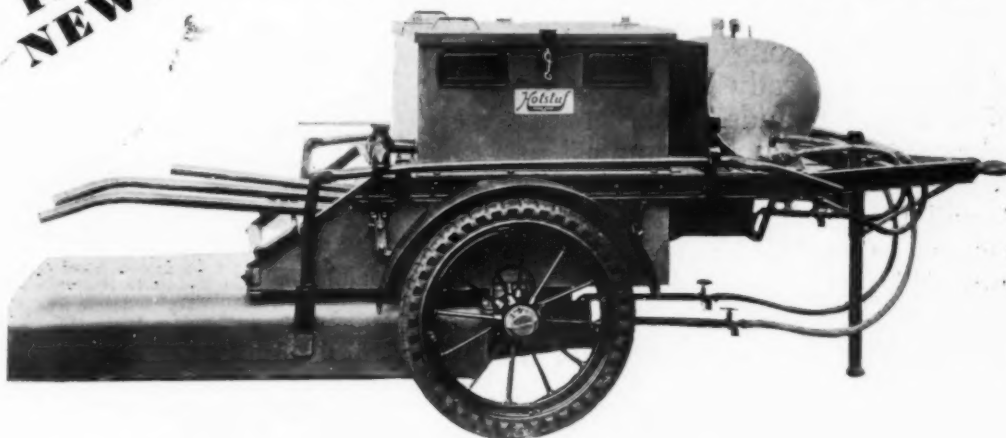
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**ST. LOUIS JAN. 10 to 16**

*ANOTHER MOHAWK LEADER  
A THREE-IN-ONE COMBINATION*

**IT'S  
NEW!**



*We are also showing our—*

**HOTSTUF ASPHALT HEATERS**

**MOHAWK HI-SPEED TOOL TRAILERS**

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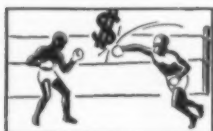
**MOHAWK ASPHALT HEATER COMPANY**

**68 WEAVER STREET,**

**SCHENECTADY, N. Y.**

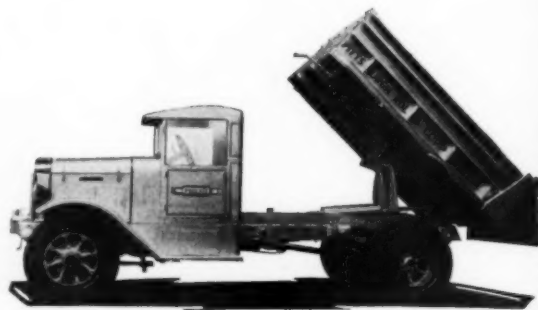


Two Dodge 3-ton trucks equipped with Model 6UB St. Paul Underbody Hydraulic Hoists for Centerville Borough, Pa., and mounted by The Schnabel Co. of Pittsburgh, Pa.



## When You're Fightin' for Dollars with Dump Trucks

It's a fight to the finish,—of the job. Old Man "Time" is the hardboiled referee and the seconds are mighty important. With St. Paul Hoist equipped trucks, you've got the job licked before you start. When the gong strikes, your St. Paul Hoists are ready for a 24-hour "go" of as many rounds as the trucks can make. St. Pauls are economical as well as tireless fighters. So your gate receipts will always show a profit, and—as Amos says to Andy, "Um! Um! Ain't dat sumpin'?"



Model W-3 International Truck 160" W/B and equipped with Model 7UB St. Paul Underbody Hydraulic Hoist for Pittsburgh Rolls Corporation.

*"Ask the Dump Truck Driver on the Job"*

# —St. Paul—

**VERTICAL AND UNDERBODY  
HYDRAULIC HOISTS**

**St. Paul Hydraulic Hoist Company**

Factories at St. Paul, Minnesota

A St. Paul Hoist Distributor and Service Station is near you. Write for name and address.

Please mention the CONTRACTORS AND ENGINEERS MONTHLY—it helps.



# ... ask the OPERATOR



—about

## Butler Equipment

HE will tell you that it's a snap to handle aggregates with Butler Bins and Weighing Hoppers. Owners, too, are enthusiastic about Butler equipment. Read what a few of them have to say in the following excerpts from letters shown on this page:—

"... Butler Bin and Weighing Hopper—very satisfactory—do not see how contractor could be without them—easily weigh out two batches per minute."

"... to use equipment for months with no upkeep or maintenance is a new and interesting experience. With a single operator we weigh two batches per minute — more than twice the speed required."

"... bin worked perfectly; not only enabled us to produce concrete cheaper, but to mix much larger quantities."

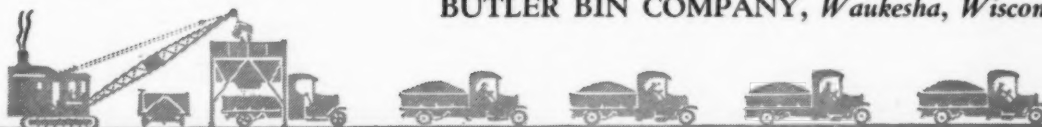
"... entirely satisfied. If we were in the market for another outfit, we would buy a Butler."

"... we are not subjected to shutdowns on account of scales varying, as they stay in perfect balance."

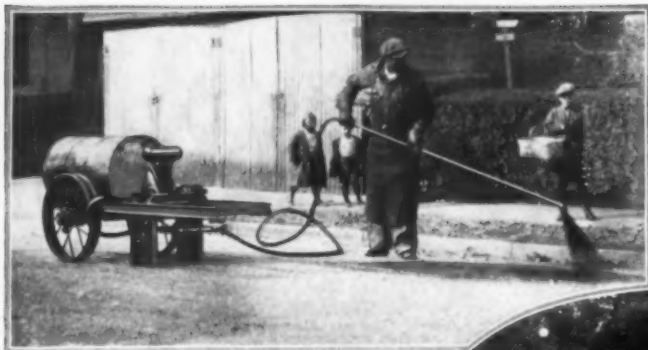
If the experience of these satisfied users interests you, we will be glad to tell you more about it at the Road Show—Booth AR-16.

BUTLER BIN COMPANY, Waukesha, Wisconsin

**BUTLER**  
Steel **BINS**  
and **HOPPERS**

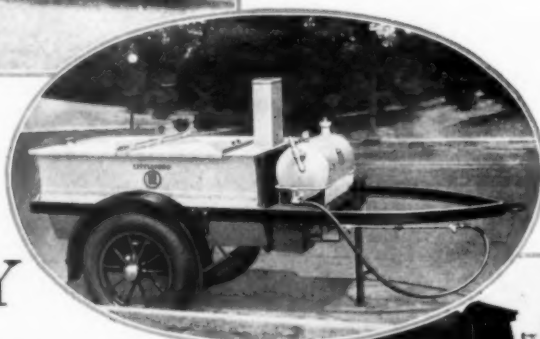


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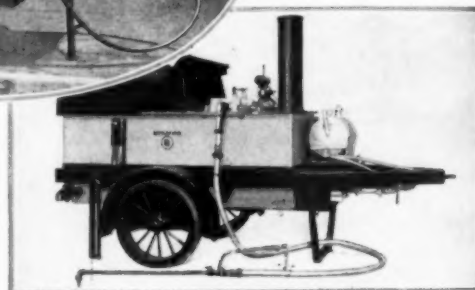
*The Littleford Motor-Driven Emulsion Sprayer. Time required to apply emulsions with pouring pots is cut in half by this machine.*

*No. 84-HD Asphalt Kettle equipped with pneumatic tires. Trail it 30 or 35 miles an hour. When you're in a hurry—hurry!*



*The Trail-O-Heater, a 300-gallon kettle, equipped with the Littleford Motor-Driven Spray. Such an outfit is ideal for large patch jobs and small resurfacing work.*

## ***They're on DISPLAY at the A·R·B·A ROAD SHOW***



*Asphalt Kettles  
(Oil and Wood Burning)  
Asphalt & Emulsion Sprayers  
Tool Boxes  
Tool Heaters and Surface  
Heaters  
Water Heaters and Concrete  
Heaters  
Steel Mortar Boxes  
Salamanders  
Joint Fillers  
Squeegee Machines  
Tools and Pots  
Traffic Line Markers  
Grout and Mastic Mixers*



Have you ever wanted or hoped for an emergency road repair outfit that could be trailed 30 or 35 miles an hour? You'll see one at the Littleford booth.

Do you use emulsions for surface treatment? If you do, you will be interested in the new Littleford Emulsion Sprayer—hand and motor driven.

Have you seen the Littleford All-Steel Tool Box for highway work? You won't want any more makeshift boxes after you see it.

That Littleford Joint Filler will fill joints and mark an asphaltic line at the same time, if you want it to.

All of the latest Littleford maintenance outfits, new and improved, are on display at Booth B-43. If you can't see them at the St. Louis Road Show, write for our complete catalog.



Littleford Bros.  
485 E. Pearl St.  
Cincinnati, Ohio

Gentlemen:  
Without obligation to me,  
send your complete catalog  
showing Littleford Road  
Maintenance Equipment.

Name .....

Title .....

Street Address .....

City .....State.....

1-31



REG. U. S. PAT. OFF.

# **LITTLEFORD**

**Road Maintenance Equipment  
SINCE 1900**

**LITTLEFORD BROS., 485 E. PEARL ST. CINCINNATI, O.**

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# Built for Road-Builders—

with contracts that must be  
finished on time and at  
the lowest cost.



## NELSON Q-7 LOADER

### For STRIPPING:

From shaving six-inch topsoil to cutting a six-foot trench in anything but boulders, rock or cypress swamp . . . . .

**IT STRIPS.**

### For FINISHED GRADING:

Cutting close to the grade stakes, smoothing down the rough spots and cleaning up the dirt as it goes along . . . . .

**IT FINISHES.**

### For DIGGING:

Whether cut-and-fill or borrow-pit, put it right into the bank—2 to 2½ yards a minute,—and make your trucks hustle . . . . .

**IT DIGS.**

### For BATCHING:

At the stockpiles with the accurate adjustable Nelson Batcher, and you can deliver on schedule to your mixer . . . . .

**IT BATCHES.**

### For Just LOADING:

Stone, earth, sand, gravel, ashes and dozens of odd jobs—into big trucks or little trucks, high trucks or low . . . . .

**IT LOADS.**

**The N. P. NELSON IRON WORKS, Inc.**

822 Bloomfield Avenue

Passaic, N. J.

**it does not pay to shovel by hand when one Nelson**



When writing to advertisers please mention the CONTRACTORS AND ENGINEERS MONTHLY—Thank You.

# GRASS ROOTS to BEDROCK

FIRST the "Caterpillar" Tractors cleared away the trees and pulled the stumps — then they stripped the sod from borrow pits—the earth that went into this dam had to be free of foreign material. Then they hauled the earth to the dam site — then "Caterpillar" Sixtys with bulldozers spread the material and rolled it. Twelve "Caterpillars" speeded to early completion this job of the American Pipe and Construction Co. near Philadelphia.

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TEN . . . . .	\$1100
FIFTEEN . . . . .	\$1450
TWENTY . . . . .	\$1900
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## Caterpillar Tractor Co.

PEORIA, ILLINOIS, U. S. A.

Track-type Tractors Combines Road Machinery

(There's a "Caterpillar" Dealer Near You)

**CATERPILLAR**  
REG. U. S. PAT. OFF.  
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## THIS IS LEADERSHIP

The new high quality, high speed, FULL REVOLVING fully convertible SPEEDER 3-8 yard shovel was announced in December «» one month ago «» yet bonafide orders for delivery have been received from foreign countries as well as all parts of the United States «» from Washington to Texas «» almost world wide acceptance within 30 days. A record perhaps «» but not accidentally.

It is a real shovel «» every gear, including bevel gears, machine cut and run in grease in inclosed cases «» 2 or 4 speed transmission, forward and reverse, high speed travel, swing, line speeds «» the famous SPEEDER patented direct action cable crowd «» weight 10 tons «» electric lights, starter, standard equipment.

See the SPEEDER 3-8 yard «» you will realize then that the Speeder Machinery Corporation has heralded a new era in quality shovel manufacture with its introduction.

SPEEDER CONVERTIBLE SHOVELS

$\frac{3}{8}$  Yd.  $\frac{1}{2}$  Yd.  $1\frac{1}{4}$  Yds.

# SPEEDER

MACHINERY CORPORATION

Pioneer manufacturers of full revolving, fully convertible, one-half yard gasoline shovels

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Cedar Rapids, Iowa, U. S. A.

# Internationals Are Built to Do Your Kind of Hauling



**T**HE building industry needs trucks that can be depended on for day-in and day-out performance, that can tackle the loads and hard going in and out of construction jobs. The long experience of International Trucks in the building trades offers sound proof of the performance and dependability of these trucks and of their real worth in the transportation of building materials.

Today there is a complete new line of International Trucks. They are advancing the reputation Internationals have for turning in the maximum pay loads and pay mileage. They are modern trucks that meet modern hauling conditions.

The best way to get acquainted with the new Internationals is to ask the nearest of 180 Company-owned branches in the United States and Canada for a demonstration. You will see International performance at first hand under all conditions you want to put it through. You will get a new conception of motor truck values. Write us for information.

## INTERNATIONAL HARVESTER COMPANY

606 So. Michigan Ave. OF AMERICA Chicago, Illinois  
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# INTERNATIONAL TRUCKS

**Special Delivery:** ¾-ton, 4 cylinders, 3 speeds forward, 136" wheelbase, spiral bevel drive, 4-wheel brakes.

**Six-Speed Special:** 1½-ton, 4 cylinders, 6 speeds forward and 2 reverse, 136" wheelbase, spiral bevel drive, 4-wheel brakes.

**Speed Trucks:** 1½-ton, 6 cylinders, 4 speeds forward, 138", 152", 164" wheelbases, spiral bevel drive. 2-ton, 6 cylinders, 5 speeds forward, 145", 156", 170" 185" wheelbases, spiral bevel drive. 3-ton, 2 types, Model A-5 (spiral bevel drive) and Model A-6 (double reduction drive), 6 cylinders, 5 speeds forward, 140",

156", 170", 190", 210" wheelbases. All have 4-wheel brakes. **Heavy-Duty Trucks:** Models W-1 and W-3, 2½ and 3½-ton, 4 cylinders, 5 speeds forward and 2 reverse, double reduction drive, "steer easy" steering gear, 4-wheel brakes. W-1—130", 148", 170", 185", 200" wheelbases. W-3—144", 160", 185", 210", 235" wheelbases.

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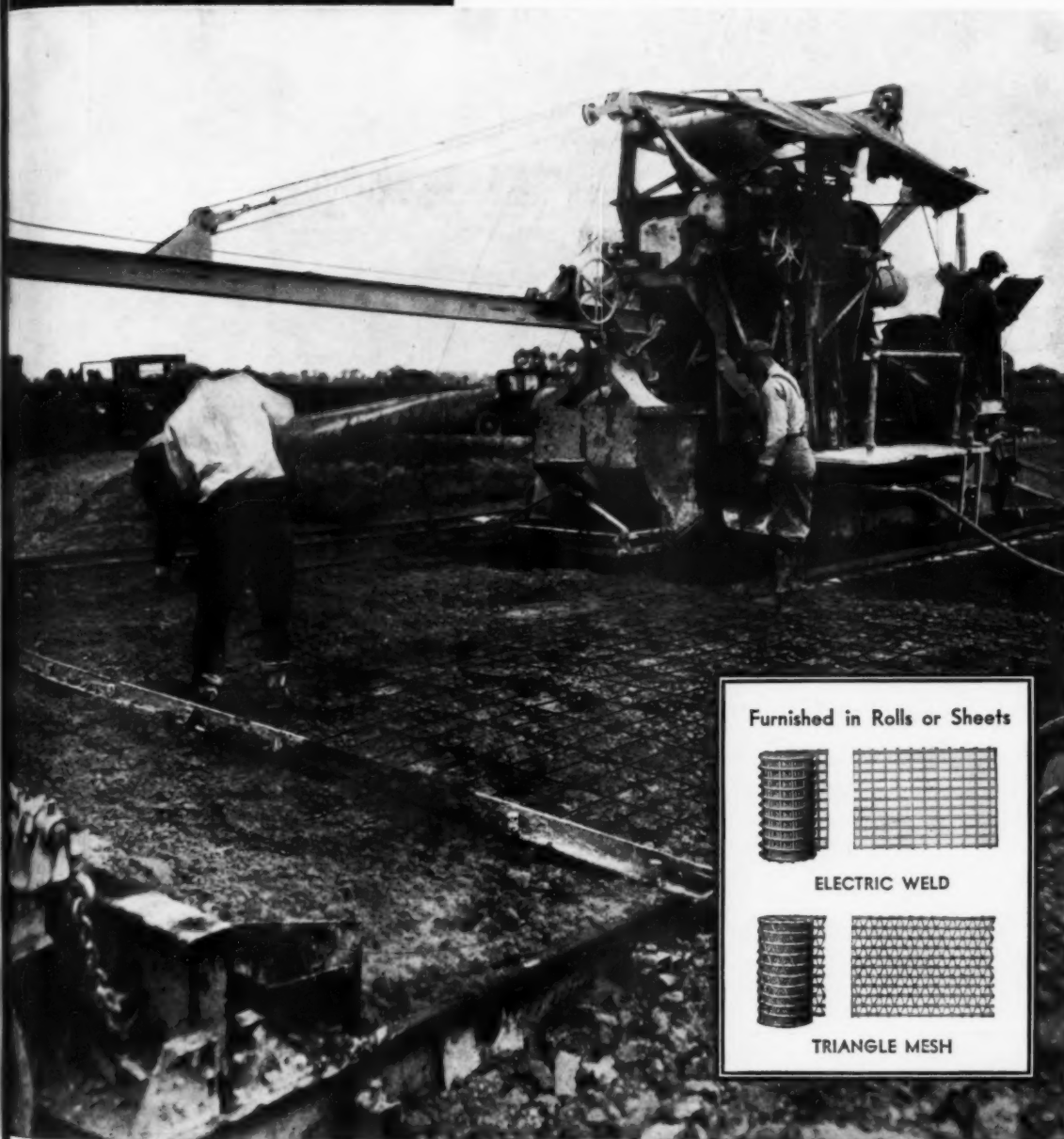
AMERICAN STEEL &amp; WIRE COMPANY

# WIRE FABRIC

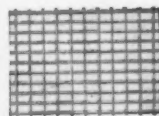
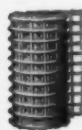
## Building Good Roads and Streets Better

Highway departments have solved the problem of "better" good roads and streets by standardizing on wire fabric reinforcement. The life of the pavement is increased and the problem of costly and disfiguring tar kettle maintenance is eliminated.

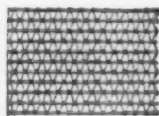
For reasons why—write for a copy of "Reinforced Roads & Streets" and "Reasons".



Furnished in Rolls or Sheets



ELECTRIC WELD



TRIANGLE MESH

1831



1931

### AMERICAN STEEL & WIRE COMPANY

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SUBSIDIARY OF UNITED STATES STEEL CORPORATION

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

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New hangar buildings, Central Airport, Camden, N. J. on which California stucco made with Atlas White portland cement was used for the exterior of the buildings. Black & Bigelow, architects, New York. Airport Construction and Development Co., general contractor, Philadelphia. Stucco furnished by California Stucco Products Co., Philadelphia. C. C. Boulden, Philadelphia, plastering contractor.

## Beautiful . . . permanent airport buildings are as necessary as beautiful railroad depots

Land has been set aside for airports in thousands of American cities. Many of these airports are but little improved. Others have only makeshift accommodations for air travelers. The next step is beautiful, permanent buildings—they are as necessary at air terminals as at railroad terminals.

Hangar buildings at Central Airport, Camden, N. J. have been built for both beauty and permanence. A light tinted stucco, made with Atlas White portland cement, makes them both inviting in appearance from the ground and easily visible from the air. Such buildings as these are a good investment.



Universal Atlas Cement Co.  
208 South La Salle Street, Chicago  
Without obligation, please send me booklet "Stucco".

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C. & E. M. 1-31

### Universal Atlas Cement Co.

Subsidiary of United <sup>US</sup> States Steel Corporation

#### Concrete for Permanence

OFFICES IN: Chicago, New York, Philadelphia, Boston, Newark, Albany, Pittsburgh, Cleveland, Columbus, Minneapolis, Duluth, St. Louis, Kansas City, Des Moines, Omaha, Oklahoma City, Birmingham and Waco.

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# It's the Little Things That Count

*The Whole  
Fine Grade  
Crew Goes for  
a Ride*



## Team Work That Produces

WHEN asked if the outfit was pouring as much as 800 feet of 18-foot, 9-7-9-inch section concrete in the average working day, the superintendent was astonished and admitted that during most of the job 950 to 1,000 feet a day was the regular thing. After the job was inspected to gather the data for this article we felt like apologizing as the teamwork on the job was so sincere and every man knew his job so well that when such a thing as a 300-foot section of subgrade 8 inches high was encountered, the grade having been prepared by another contractor the previous year, the same fine grade crew that handled things when everything was going smoothly just took a hitch in their belts and pulled out the high grade in ample time for the form setters to get through well ahead of the paver.

The job was located west of Beaver Springs, Penna., and as mentioned above had been graded the previous season under another contract. The grade was generally very good and provided a fair surface for motor traffic even before the fine grade crew began work.

### PLENTY OF ROOM AT THE BATCHER PLANT

The batcher plant was laid out in a field on a Pennsylvania Railroad siding about 1½ miles from Beaver Springs, giving a 0.6-mile dead haul to the job. In order, as one entered the site of the plant, were the cement

### Minor Troubles

*Failed to Cut the Footage*

*Poured*

*on*

*Sherman & Rhodes Concrete Job*

*at*

*Beaver Springs, Penna.*

platform, a line of storage piles of reinforcing bars, and other items each in a neat pile and not so mixed up that a half-dozen things had to be pulled over to get at the material wanted, then the inspector's office, the stone stock pile, the Johnson batcher and the sand stock pile. Opposite the inspector's office was the contractor's office.

Stone was received by truck from the quarry of J. C. Stahl at Middleburg, Penna., and from the National Limestone Co. at Nagany, Penna., by rail. The sand

came in by rail in gondola cars from the Lycoming Silica Sand Co., Montoursville, Penna. Cement from the Universal Atlas Portland Cement Co. also came in by rail.

The aggregates were unloaded either to the stockpiles or direct to the Johnson bins by a Northwest crane with 45-foot boom and a Haiss 1-yard clamshell bucket. The fleet of batch trucks alternately drove straight into the space under the batcher and then backed in to prevent the sticking of the wet sand and the cement on the bottom of the trucks and in the paver skip. This practice is becoming more general as contractors realize the value of saving the pounding of the skip and the spading of the truck bodies when they are dumping.

The cement was unloaded from the freight cars to a platform having a capacity of about one carload and covered with tarpaulin. When possible, and this was most of the time, the cement was taken direct from the cars and tossed by the three men, 6 bags to a batch, onto the trucks. The individual batches of aggregate were 1,236 pounds of sand and 1,992 pounds of stone with the six bags of cement.

The operating crew at the batcher plant consisted of the craneman, two men in the cars, and the batcher man. The fleet of trucks for hauling was owned by the contractor and consisted of seven 3-batch Autocar trucks.

#### PLENTY OF WATER—WHERE IT BELONGED

The water for the paver and sprinkling the subgrade and for the 24-hour sprinkling for curing was supplied by a new C H & E No. 11 triplex pump. A total of 15,000 feet of 2-inch pipe was used on the job with taps every 350 feet for the paver hose which was 200 feet long. The paver carried an extra 50-foot length of hose at all times to be ready for a break or a cut by a truck. The contractor did not have to stint on the amount of water as there was always plenty in the creek and the pump delivered an ample supply. The use of water where it should be used was evident. The subgrade was well sprinkled and the burlap which was placed for 24 hours after the finishing of the slab was soaking wet and not just damp.

#### A GENEROUS FINE GRADE GANG

Twenty-five men were regularly carried in the fine grade crew. The superintendent believes that it is better to have a crew a little larger than is necessary for average conditions, so that when the peak is reached or something goes wrong there is plenty of man power to carry on. With a minimum crew it means that some other part of the job has to be neglected to make up the deficiency in emergencies. It is better to work the crew until 2 or 3 in the afternoon and then lay them off than to be hunting for a few extra men when needed.

The rough grade was left very close to the line of the finished grade of the pavement so that a cut of 10 inches at the sides and 7 inches at the center was made with a Euclid rooter and a Galion Big Buster pulled by a Caterpillar Sixty to move the material to the shoulders. By this method there was a minimum of work necessary when the pavement was complete. A grader was run over the shoulders once or twice and then the shoulders rolled and the final estimate was only a few days away.

#### AT LEAST 1,000 FEET OF FORMS SET EACH DAY

Four thousand feet of Hotchkiss steel forms were used on the job, all 9 inches high, as the job was poured the full 18 feet wide. The form setting crew consisted of six men ahead setting the forms and three men back aligning the forms ahead of the paver and setting the forms that were removed to permit the trucks to turn on the shoulders quite close to the paver. A foreman and fifteen laborers with a Carr formgrader handled all the work on forms. As soon as the forms were set the fine grade crew came through with the Lakewood subgrader and cut the cross section to line. As the subgrade was very firm it was necessary to scarify it with the 12-ton Acme gas roller which was also used to pull the subgrader.

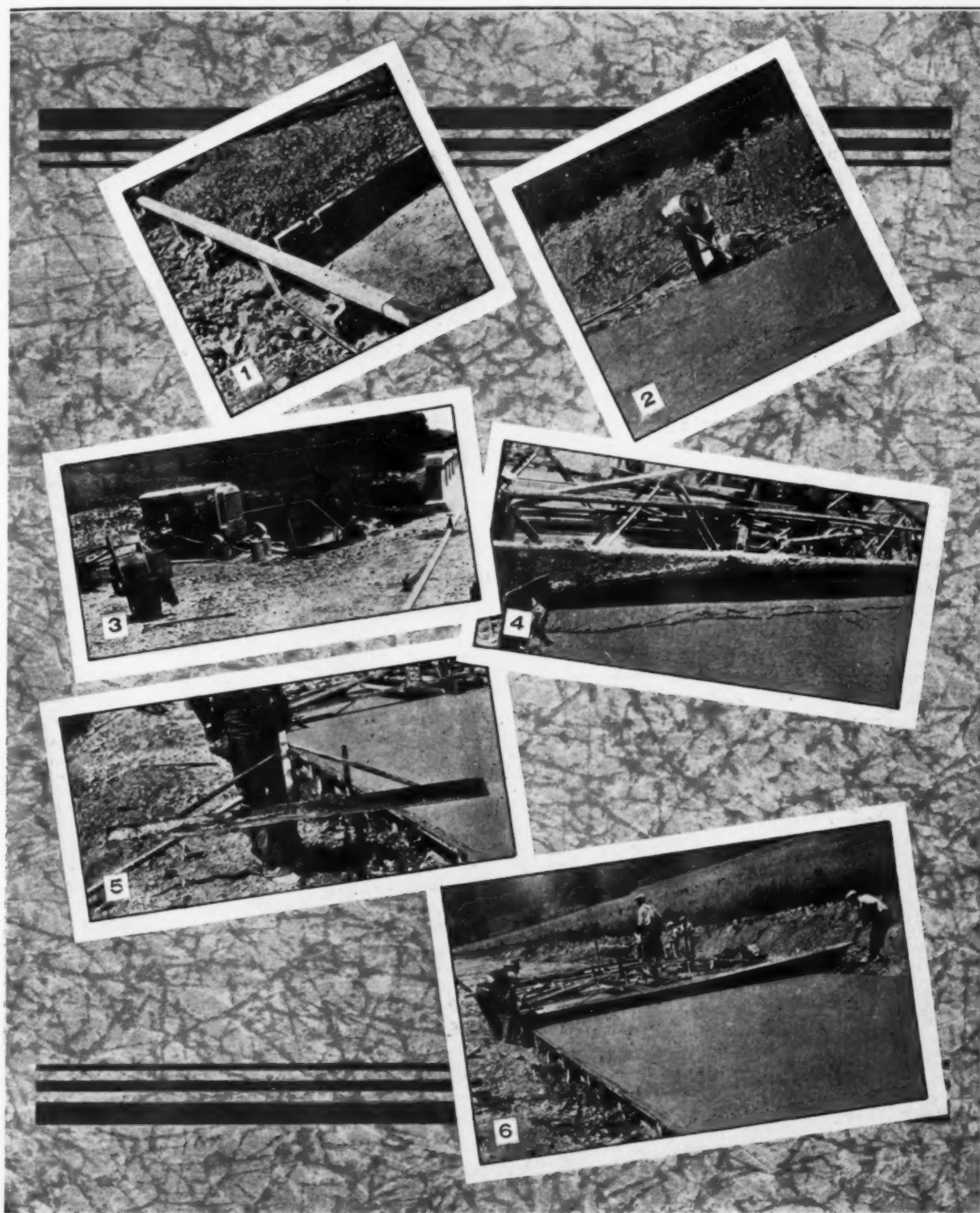
#### TEAMWORK EVIDENT ON CONCRETING

As there is most action around the paver that is the point where teamwork is most evident. Watching the crew for some time it was noted that one of the pit men was the leader; there was no foreman. Whenever a new division of the work was to be started, a short blow on his whistle started every man to his appointed task.

The cement was dumped on the batches about 100 feet from the paver by three men who cut and emptied the bags and tossed them to the grade where another man gathered them and baled them at once. At the paver one man dumped the batches, which came out clean because of the method of loading at the batcher. On the Koehring 27-E paver, 1930 model, were the operator and the calcium chloride man.

The scratch-board behind the paver was on wheels running on the forms. Two men ran this over the forms and cleaned up the high spots. There were four pit men and two spaders, all of whom helped, with the two men who cleaned up along the forms, when the strike-off was run along the forms to level off the concrete for the placing of the National Steel Fabric Co. welded Barmat. The strike-off was made with handles at the ends, and ropes attached at other points, so that every man had something to pull with and there was no aimless pushing with a shovel that just rested on the board.

The Lakewood screed, which had one operator, carried a cutting wheel at the front to divide the aggregate for the center strip machine which followed. Two of the pit men shovelled to the strike-off of the finisher which made two trips over the slab. The pit men watched the screed very carefully and when the concrete was riding rather high on the screed they went out and tread it down. Another little thing that saved concrete was the use of a shovel at the side to assist the screed in pushing the concrete away from the edge. Although all the finishing machines made today are equipped with a buffer plate at each side to throw the concrete back and prevent its running over the forms, there is still a considerable amount of the mix lost each day in this manner. The pit men would step forward and put their shovels against the buffer plate and as it pushed back they would push the shovel handle out and throw the concrete a little farther away from the edge. Thus by a little operation that required almost no human energy there was an appreciable reduction each day in the amount of concrete lost.



## SOME DETAILS OF PARTICULAR INTEREST

1. An eye bolt was placed at either end of the bulkhead to make it easy to pull it out after the concrete had been poured on both sides. 2. Spading was done very thoroughly against both forms. 3. The CH & E pump which supplied the water and the rough but welcome "rustic seat" for the operator. 4. The roll of grout ahead of the Lakewood screed. The concrete was spaded against the forms between the two passes of the finishing machine, thus the grout could more readily fill in any dry spots and completely eliminate honeycombing. 5. One of the 5-foot triangular lutes that were made by the contractor for hand floating. A 4 x 4 cut diagonally did the trick. 6. Pulling the burlap belt over the surface for the final finish. A 2 x 4 with the ends trimmed to make convenient handles was attached to the front of the burlap giving a uniform finish from form to form.



Behind the machine finisher there were two hand finishers who used long handled triangular lutes made by the contractor. These lutes were made by cutting 4 x 4 sticks about 5 feet long diagonally to give a finishing face about 5½ inches wide. They were easily handled and gave very good results with less weight than the large flat lutes commonly used in this section. The finishers also straight-edged the pavement, corrected any irregularities and pulled the burlap over for the final finish. The burlap belt, so-called by most contractors, is usually just a piece of burlap dragged along the surface to roughen it to give better traction to the pavement. The belt in this case was attached to a 2 x 4 trimmed to make handles at the ends and pulled along by the wood handle, giving a very uniform appearance to the pavement. When not in use the belt was placed on a rack on the back of the finishing machine. There was one hand edger just ahead of the joint machine which was run by one man.

#### PLACING THE CENTER JOINT

As already mentioned, the initial operation on the center joint was done by the finishing machine. After the hand finishers had completed their work the Cleft center joint machine was run along by hand, the slot completed and the premoulded joint inserted.

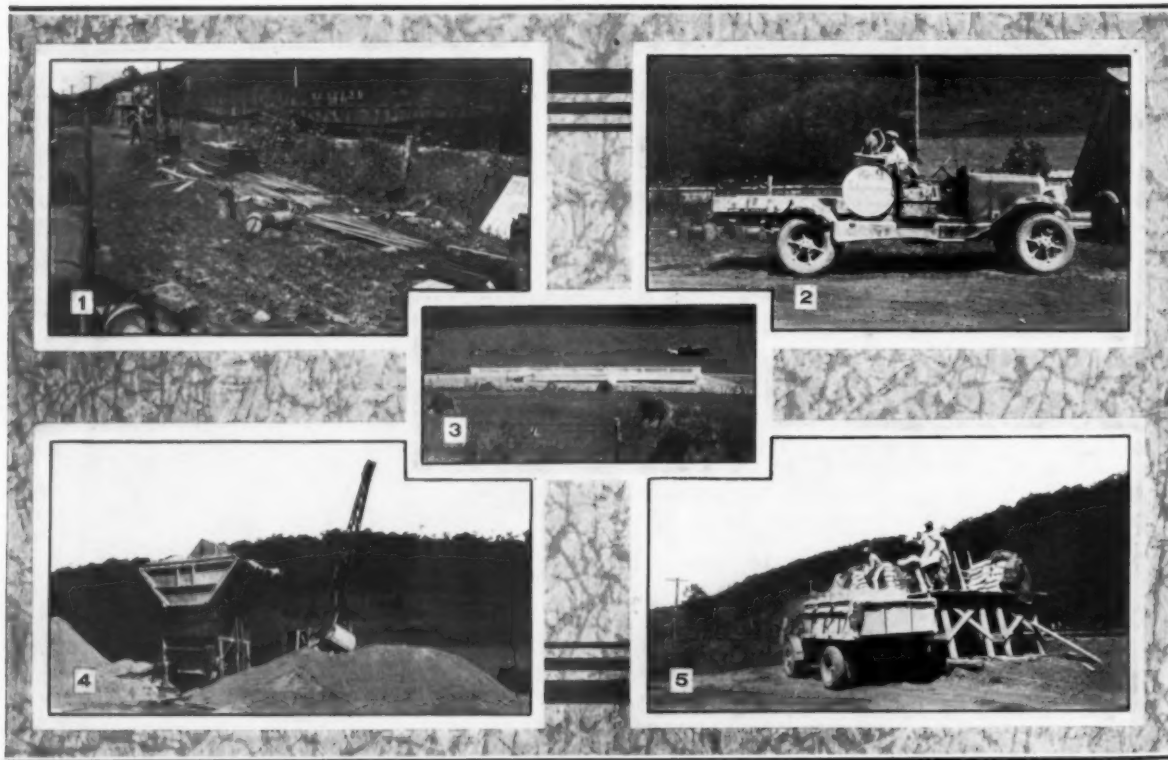
As a package of the premoulded center strip was opened it was passed over in convenient amounts to the operator of the machine and neatly stacked on the machine to protect it from dirt and distortion. As the fin-

isher made two passes over the slab the cutter divided the aggregate very cleanly. Then when the Cleft machine went over, the aggregate was pushed aside a third time. A double angle with a slot was hung on hooks or the center joint machine so centered that the joint would be exactly on the center line of the slab. The joint was inserted in 5-foot lengths through this slot, the angles removed and the edges of the concrete on either side of the premoulded joint troweled to smoothness. Then a homemade double or straddle float of wood was run along the joint to insure uniform height of the concrete on both sides. Following this a 6-foot straight-edge was pushed against the joint to give it a true line and then a brush run along each side to remove the float marks. The joint was left about ¼-inch high and was cut off with a spade after the concrete was cured, leaving a neat straight center plane of weakness to take care of longitudinal cracking.

#### CURING REDUCED TO A MINIMUM

By the addition of calcium chloride at the mixer there was little to be done to the pavement after pouring, as far as curing was concerned. The standard Koehring calcium chloride machine was used with the pump, supplying the solution at a constant volume to the dosing tank and the three-way valve shutting off the supply when the skip went up.

Four boys spread the burlap on the pavement longitudinally from two Heltzel rolling bridges running on the forms. The burlap was in strips 3 feet wide by 20



#### SCENES AT THE NEATLY ARRANGED STORAGE YARD AND BATCHING PLANT

1. Stock piles of reinforcing steel, expansion joint, etc., at the storage yard between the cement loading platform and the contractor's office at the batching plant.
2. The utility truck with its gasoline drum and flat bed body was constantly on the jump.
3. A well-designed concrete bridge on the job as seen from the office.
4. The Northwest crane landing the clamshell on the stockpile for another "bite" of sand for the Johnson batchers.
5. Tossing the bags of cement onto the batches in the truck





## COMMON-SENSE METHODS

1. A home-made scratch board used on fine grade. Read the text for a detailed description. 2. The corner reinforcing rods at the expansion joints were wired to the Barmats on the shoulder instead of waiting until the mats were on the concrete

feet long and when brought up from the rear was spread carefully on a platform from which it could be lifted easily and spread from the bridges. Two men spent all their time wetting down the burlap for the entire 24 hours which it remained on the finished pavement.

## SOME MORE OF THE LITTLE THINGS

A flat bed utility truck of about  $1\frac{1}{2}$ -tons capacity carried a 75-gallon drum for gasoline with a hand pump so that it could deliver gas to any piece of equipment on the job in a minimum of time. There was no steam equipment on this contract. This same truck was used to bring forward the burlap when removed at the end of 24 hours. Another flat bed truck distributed the Barmats along the shoulders and brought up the forms each morning before the paver started. It also distributed the bags of Solvay calcium chloride along the shoulder but no farther ahead than the day's run was expected to cover.

On the fine grade a homemade scratch-board was used that was adjustable to any contour. There were short pieces of strap iron every 6 inches across the entire 18 feet of the 2 x 8 plank and each piece was cut to a point at the end and had two slots for bolts by means of which the individual pieces were adjusted to the proper depth.

One argument very much in favor of pouring the full 18-foot width of the pavement is that there is room to keep the trucks close to the paver without tying up the operations ahead, as is the case when the single strips are poured.

Extra shovels were hung from a pole on the paver and picks were pushed into the tool box beneath the paver operator's platform. The extra 50-foot length of hose for the paver was carried in the box on top of the paver as well as spare parts for the paver.

## SETTING AN EXPANSION JOINT

The outstanding example of teamwork and doing the little things right was in the setting of the expansion

joint. Going back just a minute to the setting of the steel, it was noted that when the fabric was taken from the shoulder, four men did the trick on each side. The two inside men were pit men with rubber boots and the two outside men in each case were the subgrade men who were not in rubber boots. Four-foot dowels were placed every 5 feet along the center of the slab to bond it along the joint. These were just laid on the concrete when the fabric was placed.

When an expansion joint was to be placed the superintendent was almost always present. The exact point was marked out on the forms, a 3-4-5 triangle run to insure that the joint would be at right angles to the center line of the road and then two of the pit men went out and wired the reinforcing steel to the fabric. There were pieces of steel 1 foot away from the joint on either side and another piece 3 feet 1 inch away as well as one piece at 45 degrees running from the outside corner. These pieces were wired to the fabric before it was placed on the concrete, a task much easier on the shoulder than when the steel was on the concrete. That's just another little thing.

The expansion joint was set with a bulkhead made from a 2-inch plank cut to the contour of the road both top and bottom. Eight pins were driven on each side of the bulkhead and premoulded joint to hold it firmly. It was of interest to note that in spite of the fact that the men worked in the pit setting the joint, not a single batch of concrete was delayed, so well was the operation timed. The bulkhead had eye bolts set at each end to assist in pulling it out after the joint had been poured on both sides.

## TWO MORE LITTLE THINGS

A booster was installed on the paver engine that made it possible to save a couple of seconds on the raising of the skip. This procedure has been criticized on the score that it would wear out the engine sooner. The

(Continued on page 80)

# Heavy Going



*A Mason Flexible Steam Joint as Used on the Water Line Supplying the Paver. Note the Hand Bars Which Made Wrenches Unnecessary*

**W**HAT the Resident Engineer termed "100 per cent mean regrading" was what Pennell & Harley, Inc., faced in the rough grading of the old subgrade between Highlands and Franklin, N. C., for a distance of 8 miles. About 25 per cent of the job was on new right of way but the remainder was enough to make a contractor's hair turn prematurely white. Water from the heavens and water alongside the road in a river that left no room for running even a team alongside the road slab for bringing up the forms; these combined to make the job a difficult one, but the fine spirit and organization of the outfit pulled the work through on schedule.

The contractors had two railway cars fitted as offices and work shops and living quarters for the principals of the organization. The job was started March 10, 1930, when culvert construction began. Grade work began March 24, and concreting May 16, 1930. The contract called for the completion of the work in 120 working days.

## SHAPING UP THE ROUGH GRADE

The total bid for the job was \$155,507.30 with the quantities and unit prices as follows on the major items: 16,000 yards of rock excavation at \$1.00 and earth excavation at 45 cents, 6,400 yards of borrow at 40 cents, and 75,410 square yards of concrete slab at \$1.78. The bid of 40 cents for borrow as against 45 cents for excavation is interesting as it tends to keep the item of excavation down when any changes are made by the State-engineers.

*Over*

# Old Subgrade

*Pennell & Harley, Inc.*

*of Spartanburg, S. C.*

*Held Up*

*in Boggy Subgrade*

*Over Old Road*

*by Spring Rains.*

*Good Organization*

*Pulled the Job Through*

*on Schedule*

A Caterpillar Thirty pulling a Western Rip-Snorter with an 8-foot blade and a scarifier tore up the old grade for the regrading. A total of 54 mules with Western rotary scrapers handled all the moving of the earth from cut to fill and on borrow. A Buffalo-Springfield 10-ton steam roller was used to compact the grade for the final grading. About 60 men were employed on the rough grade with a total of 140 men on the job.

There was some rock on the job but a power shovel was not necessary, as the rock was easily moved by hand, after being drilled with a Chicago Pneumatic jackhammer and compressor and shot lightly with 60 per cent Hercules dynamite. The rock was badly seamed and the drills got hung up very easily. It was a disintegrated granite such as is found quite extensively in this area.

## DRAINAGE STRUCTURES

The drainage structures on this project included one triple 8 x 6-foot reinforced concrete box culvert 32 feet long, 8 x 6-foot box culvert 40 feet long on a 45-degree skew, a 6 x 4-foot culvert 32.25 feet long, a 3 x 4-foot culvert 30 feet long, a 3 x 4-foot culvert 35 feet long, a 5 x 4-foot culvert 41 feet long on a 45-degree skew, and

a 6 x 6-foot culvert, 37.5 feet long on a 45-degree skew. A 4 x 4-foot culvert was extended 14 feet on account of a change in center line and a 4 x 3-foot culvert, 38 feet long, was also built.

All of the concrete used was Class A, of 1:2:4 proportions mixed 1½ minutes, and the sand was inundated. There were 13 new pipe culverts required for which 18-inch paved invert Armco iron culvert pipe and Class B construction hardware was used.

#### FORMS LAID AND MOVED BY MAN-POWER

The fine grade crew consisted of about 25 men. The contractor always carried a slight surplus of men on the fine grade so that there would be men available to call back to work on forms should occasion arise. In this job the extra men were used frequently to carry the forms ahead after they were pulled as no team could pull a wagon through the narrow right of way between the road slab and the river bank or mountain side. The forms were toted, two men to a form, for considerable distances. Because of the large labor crew used, the contractor maintained two camps, one for white and the other for negro labor.

A Carr form grade cutter was used to prepare the form trench. The specifications required that the forms be in place and lined up for 200 feet ahead of the paver but the contractor always had at least 400 feet ready. During the bad weather in the early part of May even the forms were bogged. The trucks running on the subgrade jarred the ground sufficiently to cause the forms to get out of line and men had to be kept along the grade at all times while the ground was in this condition to realign the forms.

Metaforms were used for the forms and were laid very neatly and with excellent line even on the super-elevated curves. The slab was 16 feet wide and 6 inches thick, uniform, but with a 1-inch crown.

A homemade subgrade planer proved very effective. It was built of four 2 x 8-inch planks bolted together and with a 4 x 4-inch truss. It was carried on wheels with an eccentric axle and had a continuous series of flat plates bolted to the face to cut the grade to a true contour. A Lakewood subgrader was also used.

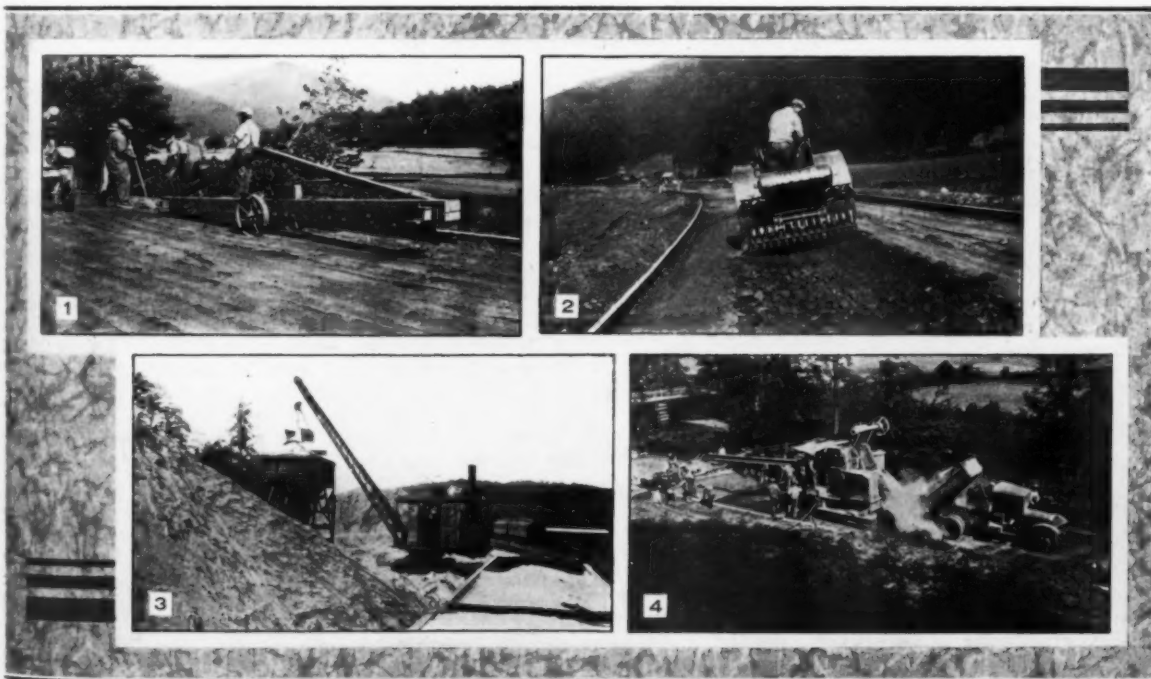
#### BATCHER PLANT AT FRANKLIN

The batcher plant, consisting of Butler bins and weighing hoppers, was located at Franklin on a railroad siding with about a half-mile dead haul. The pouring was started at the far end of the project and continued toward Franklin throughout the work.

Stone was received by rail from the Holston Quarry Co., Liberty, S. C., and unloaded by an Erie steam crane with a ¾-yard Blaw-Knox clamshell. Sand was received by rail from Foster Bros. Sand Co., at Columbia, S. C., and the Georgia Sand & Gravel Co., Augusta, Ga. Penn-Dixie cement was used. The individual batches were made up of 2,423 pounds of stone, 1,104 pounds of dry sand plus an allowance for moisture, and 6 bags of cement. This gave an approximate 1:2:4.25 batch which was mixed for 1¼ minutes at the paver.

#### ONLY PART OF BATCH HAULING WAS SUBBED

Nineteen 2-batch and two 1-batch trucks were used for hauling the batches to the paver. Of these six 2-batch GMC trucks and one Ford were owned by



PART OF THE EQUIPMENT THAT HELPED PULL THE JOB UP TO SCHEDULE AFTER DELAYS CAUSED BY "WET GROUNDS"

1. The home-made subgrade planer made of four 2 x 8-inch planks and a 4 x 4-inch truss.
2. A nice piece of super elevation on a long curve built on new fill.
3. An Erie steam crane unloaded the aggregates and kept the hungry Butler bin and weighing batchers well filled.
4. The concreting crew snapped in action. A GMC truck delivering a dry batch to the Rex 27-E paver, and the Ord finishing machine creeping up on the pouring



the contractor and the remainder were 2-batch White trucks hired from Asheville, N. C. After backing under the batchers and receiving the aggregates, the trucks pulled over to the cement car where two men were opening the bags of cement and two others tossed 6 bags on the top of each batch.

The trucks turned on the subgrade through a breach in the forms and then backed to the skip. Two men climbed onto the trucks and emptied the cement onto the batches.

#### A CLOSE-COUPLED CONCRETING ORGANIZATION

The concrete crew consisted of one man to dump the trucks, one operator for the Rex 27-E paver, two men tamping forms and oiling them, four men on final grade behind the paver shovelling from and to the drag-board pulled by the paver and running the final checkboard, one man was used to hand tamp the grade when the grade was low and filled or the least bit boggy, three men shovelled concrete, spaded and also carried concrete to the strike-off of the Ord finisher when necessary, one machine finisher operator, two men hand finishing and two extra men brought back from the fine grade gang when there was trouble with the sand and the finishing was hard and also when working around the widened and superelevated curves, two regular men used the transverse float 20 inches wide and 2 feet longer than the width of the roadway slab and then went back to use the longitudinal float from twin bridges running on wheels on the forms. The float was 13 feet long and the distance between the bridges 15 feet. This was followed by the final finishing with a canvas belt supported by an arched board.

There was no reinforcing in the job and no expansion joints. At night when shutting down, a header board was put in with 8 dowels, 4 feet long and  $\frac{3}{4}$ -inch diameter, across to bond the new slab.

When the subgrade dried up a bit permitting the hauling to go ahead without miring the trucks, the paver averaged 1,200 feet of the 16-foot slab, 6 inches thick, per 10-hour day.

#### WATER SUPPLIED BY THREE PUMPS

Because of the rough country and the possible need of repair parts and the fuel supply, two steam pumps supplemented by a Barnes gas pump were used. The locations were shifted as soon as the slab was poured up to the pump site, as it was impossible to easily fuel

the pumps and the pump men would have had to walk long distances to get to camp or for supplies. With the pump always ahead of the paver, a truck could service the pumps and carry the men to camp.

Two pumps were always used on the 2-inch supply line, one at either end. A Mason flexible steam joint was used for the taps which were located about 180 feet apart. The flexible character of the joint was a great protection to the hose at the tap and the 12 inches of leverage supplied by the hand bars made the breaking of the joint a quick job when shifting the hose. There was no shouting for the wrench. The paver hose was  $1\frac{1}{4}$ -inch and 100 feet long. The valve was 1 inch.

At one point on the job where a dry rock wall had been set up to hold the grade in accordance with the design of the project, the jarring of the trucks weakened it so much that just as the paver reached it the wall went out. It was necessary to do some quick timbering to prevent any trouble in moving the paver across this section.

#### CURING

Following the final belting of the concrete, two of the contractor's men placed burlap on the slab. The burlap strips were 10 feet wide and 2 feet longer than the width of the pavement. They were moved along the slab on a rolling bridge and were folded in three parts to facilitate handling. When being brought forward from the previous day's pour they were folded and rolled. The burlap was sprinkled for one day and then removed. The remainder of the curing, including the placing of the earth on the slab and the sprinkling was subbed to the same organization that handled some of the grading. They removed the earth to the shoulders in 14 days. The sprinkling was for only 10 days.

#### PERSONNEL

The project was built by Pennell & Harley, Inc., of Spartanburg, S. C., with James B. Harley, one of the owners, acting as Superintendent. B. S. Marsh was Resident Engineer and J. C. Walker, District Engineer at Asheville for the State Highway Department.

### The Record of Illinois in 1930 Road Construction

ON November 1, 1930, the State of Illinois had awarded contracts for the building of the equivalent of 1,044 miles of 18-foot concrete pavement and will complete 830 miles before the close of the year. This difference is explained by the fact that contracts for lengthy mileages to be built next year have been awarded this fall so that work can start immediately in the spring.

This is indicative of the progressive attitude constantly followed by Illinois. Plans for highway construction are laid well in advance, so that construction proceeds without a hitch. Illinois hopes to greatly alleviate the unemployment situation by removing all legal difficulties at once, so that men may be placed at work on the roads as weather permits.

In 1924, Illinois set a year's construction record of 1,113.5 miles of concrete paving which still stands. The impetus given to road building in Illinois by the two State highway bond issues totalling \$160,000,000 has made it possible for that State to make remarkable headway in paving her State highway system. Now that Illinois has a three-cent gasoline tax, noteworthy sums are being devoted to extending the bond issue pavements and to widening.



Two Converted Passenger Coaches, "Parked" on a Siding at the Batching Plant, Furnished Offices and Sleeping Quarters for the Principals of Pennell & Harley



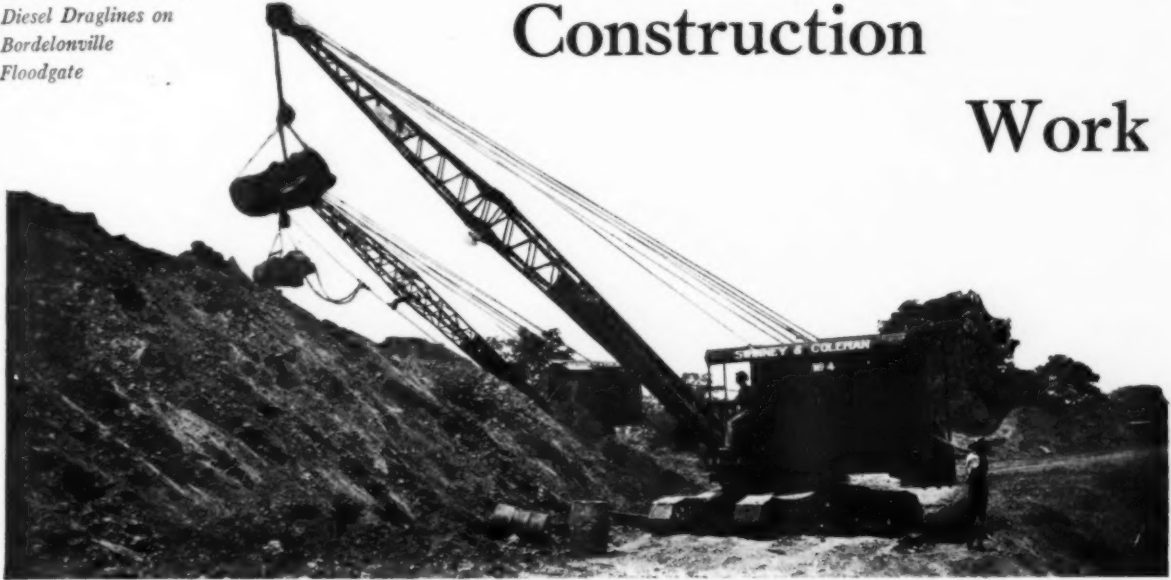
# Diesel Engines

on

## Construction

## Work

Lorain 75-B and 75-A  
Diesel Draglines on  
Bordelonville  
Floodgate



**I**N comparing diesel engines and gasoline motors in construction work, one of the main factors is what part of the total cost is the fuel cost for each one of these motors and how many hours a year are the motors actually running. If the motor is on a crane which is loading a bin for a paving job in Pennsylvania, where pavement is laid from May 15 to November 1 and the crane is shut down for weather many days of that time, it would not pay to equip the crane with a diesel engine because of the extra cost of that unit. In addition, fuel cost is a small factor in the total cost of the operation described. If the motor is on a shovel in the South which will run 9 months of the year and will not be held up for weather to any great extent, then the saving of fuel will be a big item and the diesel motor will be advantageous. In addition it has more power than the gasoline engine.

### WHY DIESEL MOTORS ARE SUPERIOR ON SEVERAL TYPES OF WORK

We used gasoline motors for a long time before we were convinced of the superiority of the diesel engine in our work. These advantages are mainly (1) low cost of the fuel, (2) increased power of at least 25 per cent over a gasoline motor, (3) the small amount of fuel to be hauled and handled to the machines, (4) the fact that the fuel is valueless to outsiders and can be left anywhere with practically no danger of theft.

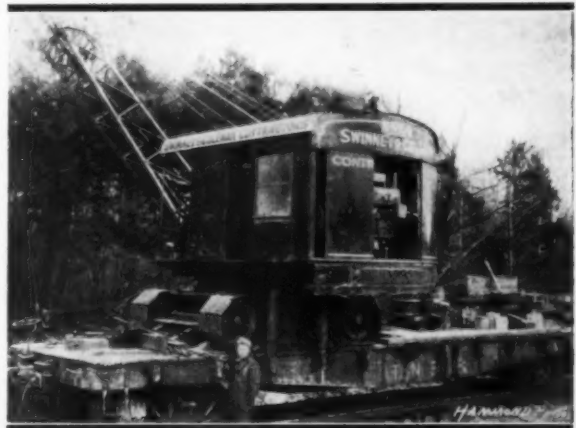
### LESS CHANCE OF STALLING THE DIESEL WITH HEAVY LOAD

The diesel motor will handle a heavy load in a pinch with no slowing down where the gasoline motor will stall or lose its pep as an automobile does when it runs

By

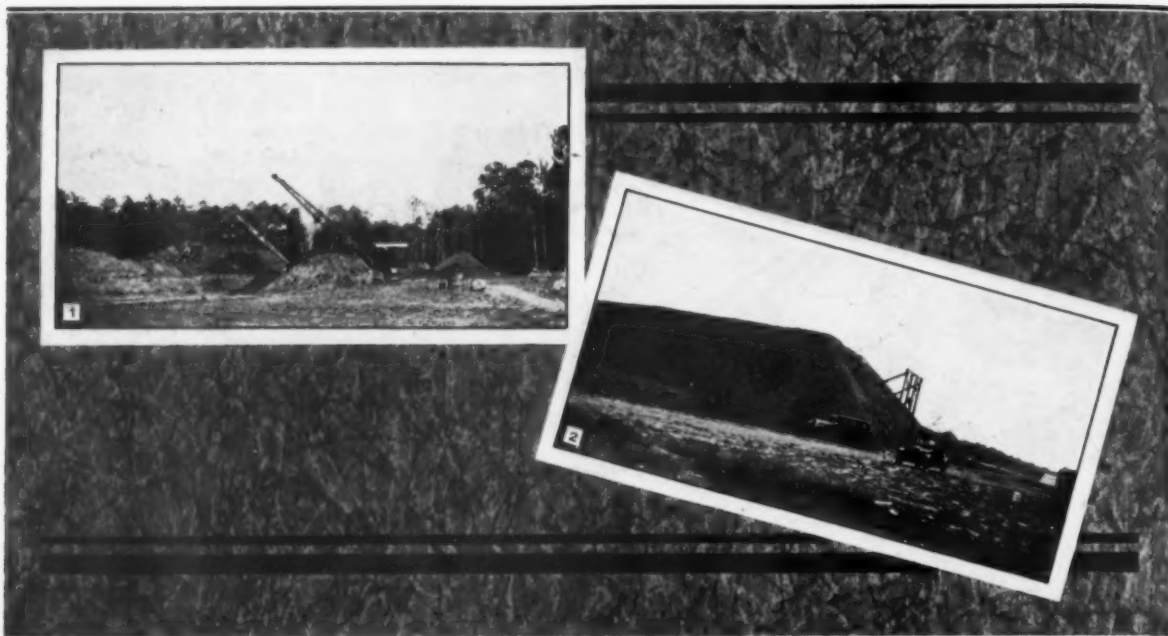
R. E. Swinney

Swinney & Coleman, Contractors, Port Allen, La.



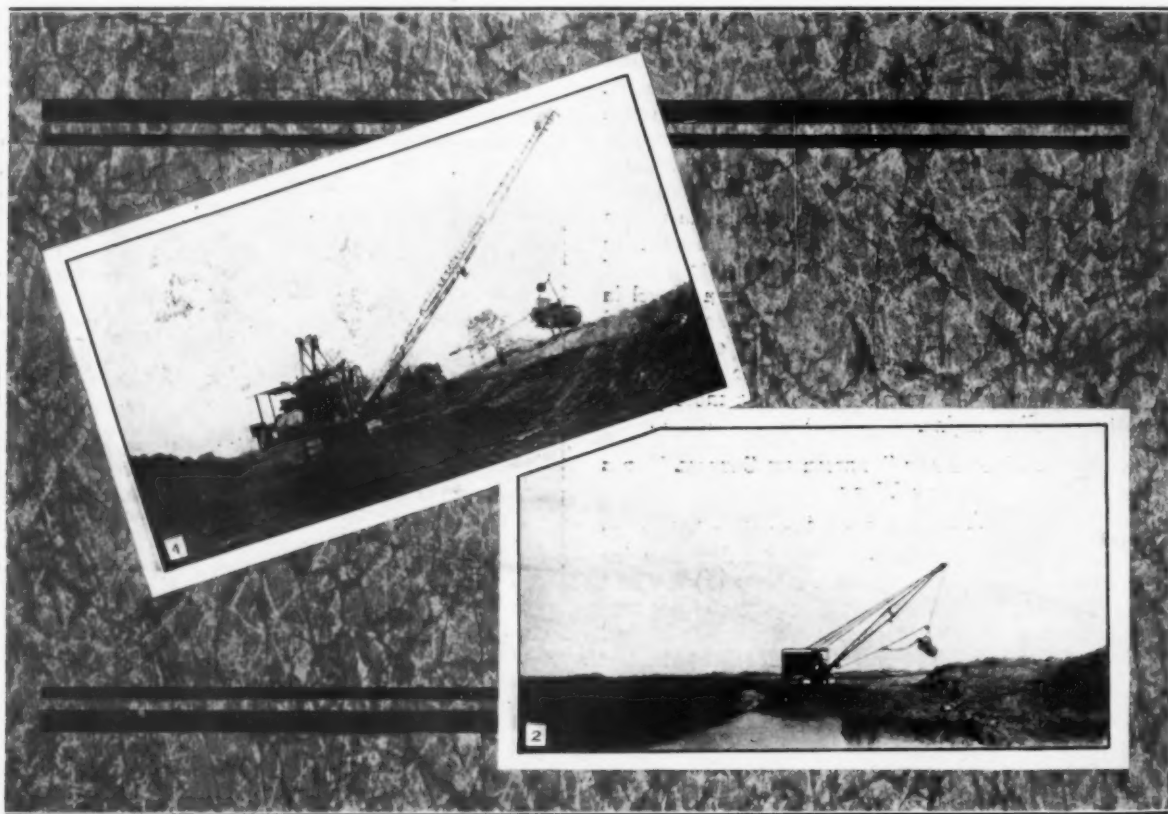
### A PLACE WHERE THE DRAGLINE BUILT ITS OWN RIGHT OF WAY

In the spring flood of 1929 most of the railroads of Alabama and Mississippi were washed out and operations were suspended for two or three weeks. This new dragline with an Atlas diesel motor was on cars ready for a new job about 200 miles away but the A. T. & N. R.R. was washed out in places for 40 miles. This machine was pushed ahead of an engine and used to rebuild all the track for these 40 miles. No one had ever before worked a dragline on a flat car, and the railroad superintendent was afraid that it would tip over when the machine reached out 40 feet for a dipper of dirt. No trouble was experienced



**BUILDING THE APPROACH TO BUTLER BRIDGE OVER THE TOMBIGBEE RIVER IN ALABAMA**

1. This section of the fill was 35 feet high, so the dirt was passed from the Thew-Lorain on the right to the Northwest in the center to the Koehring on the left, which placed the dirt in final position in the embankment. 2. View of the completed embankment. All dirt was handled by draglines and none was hauled



**DIGGING DRAINAGE CANALS IN WEST BATON ROUGE PARISH, LA.**

1. A Northwest dragline equipped with a Cummins diesel motor. 2. A Thew-Lorain 75-A powered with an Atlas diesel motor

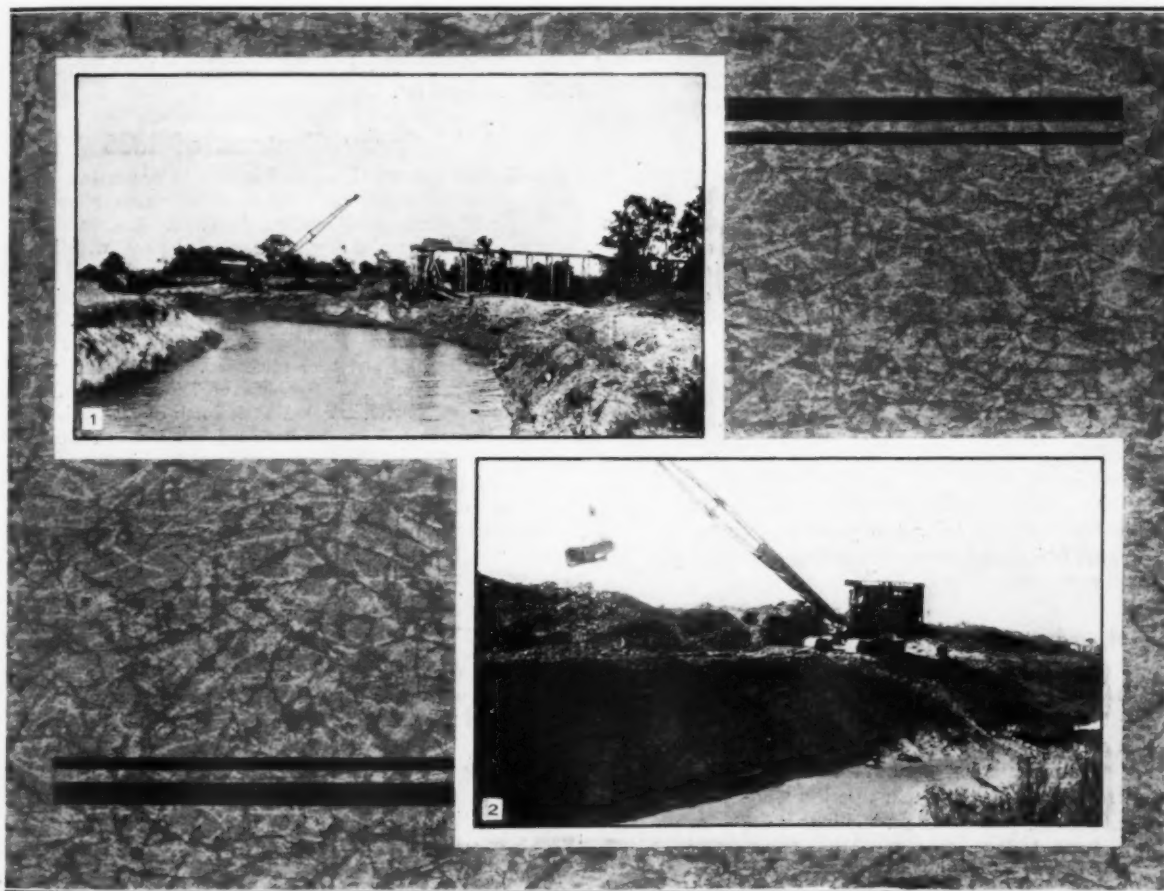
into a muddy road. The diesel keeps up that same speed due to inherent characteristics of a diesel which are far too technical for most of us to comprehend. We have found that in our dragline machines, a 68-horsepower Atlas diesel will put a load of  $1\frac{1}{2}$  yards of wet clay up onto a 20-foot spoil bank that would require a 91-horsepower gasoline motor to handle, and that with difficulty.

#### THE FUEL PROBLEM

We have found from our experience that the diesel motor uses about one-third as many gallons of fuel as a gasoline motor. Handling the fuel in loading the ma-

of distillate and gasoline as a fuel for the two prime movers under discussion. The following paragraph will be devoted to a brief description of some of the jobs we have handled, with costs showing the expense of distillate.

*Alabama State Bridge Job.* This job consisted of building a high fill for an approach to a bridge over the Tombigbee River. The embankment was from 15 to 30 feet high and was about 2 miles long. The total yardage was about 200,000 yards which was handled on an average twice, so that about 400,000 yards of material was handled between May 1, 1929, and November 15, 1929. We used a Thew-Lorain with an Atlas diesel and



EXCAVATING DRAINAGE CANALS FOR RICE FIELDS AT LAWTELL, LA.

1. A Lorain 75-A with an Atlas diesel. Note the rice pump with its trestle flume for carrying water. 2. A Lorain 75-B with an Atlas diesel working on the same job

chine and hauling the lesser amount of fuel over rough country to the machine is an item very much in favor of the diesel motor. Distillate is very cheap and of no value to the outsider. We can leave any number of drums along a drainage canal when the weather is good with no fear of its being stolen. With a gasoline motor it is not safe to leave the machine over Sunday without draining the motor, and no one of sane mind would think of scattering out a dozen drums for a two weeks' supply of gasoline, along the job.

#### SOME COST DATA FROM ACTUAL JOBS

The first item mentioned above was the comparison

a Northwest with a Cummins diesel. Part of the time we also had a Koehring gasoline dragline on the job. The Atlas and the Cummins used about 20 gallons of distillate per  $11\frac{1}{2}$  hour shift, or about 40 gallons per day of 23 hours. Distillate in this isolated place cost us 10.5 cents a gallon delivered, or about \$4.00 per day per machine. For 25 days per month the cost of distillate was about \$100 per month for each of these machines. To use a machine with a gasoline motor on a double shift 23 hours a day would have cost about \$550 a month and this has been checked, as there were many gasoline machines operating in other parts of Alabama on exactly the same class of work.



## COST VERSUS SERVICE

## Experience That Counts

P. M. Coleman, of Swinney & Coleman, is a graduate Civil Engineer from Georgia Tech and R. E. Swinney is a graduate Civil Engineer from Cornell. When this team started out they decided that because of the close competition, a man must get away from gasoline bills to stay in the excavation business. Over two years ago they bought a Northwest 1-yard dragline with a Cummins diesel engine. Later they bought a Thew-Lorain 75A with a 68-horsepower Atlas diesel which proved very satisfactory. In the Spring of 1930 they followed up with another Lorain 75B with an 81-horsepower Atlas diesel. It had a 1½-yard bucket and a 50-foot boom. The diesel experience of Swinney & Coleman covers about 1½ million yards of excavation in about 20 months.

Mr. Swinney writes, "We have no use for gasoline engines from now on for our work, although we would not recommend diesel engines to contractors who do not follow up their business closely and believe that any tramp operator is good enough, if cheap enough. We work 24 hours a day and have done so for two years, the machines being idle a half hour at noon for oiling and a half hour at midnight, so that they really run 23 hours. We do not excavate on Sunday.

"The additional cost for a diesel motor on a 1¼-yard machine is \$3,000. The statement which was made in the article on diesel engines in the May, 1930, issue of CONTRACTORS AND ENGINEERS MONTHLY that it takes two years to pay the difference is incorrect according to our figures, as you will note by my discussion."

**West Baton Rouge Drainage Canal.** This job was completed between December 1, 1929, and April 10, 1930, and consisted of excavating 390,000 yards of canals in the sugar plantations of Louisiana across the Mississippi from Baton Rouge. On this job we purchased our distillate delivered to the machines at 8.5 cents per gallon and cut down the monthly cost per machine to about \$80 for fuel, still working 2 shifts of 11½ hours each or 23 hours a day. Gasoline in this locality was cheaper than in the Alabama district and if we had used gasoline motors, the expense would have run slightly under \$500 a month, perhaps as low as \$475.

**Excavation for the Bayou des Glaizes Floodgate.** This work, a part of the Mississippi River Flood control system, was handled with a car of distillate which cost us 4 cents per gallon. We added another Lorain equipped with an Atlas diesel motor making three diesels altogether. This wholesale price for distillate cut the price of fuel with the three diesels to about \$40 per month for each machine, all working day and night. On this job we moved about 250,000 yards of dirt.

**Lawtell Drainage Canals, Lawtell, La.** This job will total about 650,000 yards and is now under way. The distillate cost is slightly over 4 cents so that the cost per machine is about \$40 per month for fuel.

We realize that the extra cost of the diesel must be considered, but based on our experience we feel sure that the diesel motor, due to its extra weight and heavy construction, will last as long as two gasoline motors in our type of work, so that we do not count in the extra cost. Further, the diesel motor is a slow speed motor and lessens the vibration on the equipment. We feel that a diesel motor is suited for continuous dragline work, for steady work in quarries, gravel and sand pits and not for spontaneous work such as rented cranes, paving or similar equipment. We have standardized on Kohler light plants on all of our draglines as the only ones which seem to stand the constant vibration of dragline machines running every night of the year. We have also equipped all of our draglines with Leschen Red Strand cables.

## A Highway Contract of 1855

A ROAD contract signed on May 25, 1855, has just been unearthed in St. Paul, Minn., and offers an interesting insight into road building in territorial days. The document is very rare as few roads, at that time, were built by contract from definite plans and specifications.

The document was sent to C. M. Babcock, Commissioner of Highways of Minnesota, by Miss Anna Hartin of St. Paul, who found it among papers belonging to her mother. The contract is in longhand and well preserved. The signers were J. S. Simpson, Captain, U. S. Corps of Topographical Engineers, and J. P. Newton and J. W. McComb of St. Paul, who were the contractors. On the back the contract is endorsed, "Approved, S. Cooper, Acting Secretary of War."

A printed copy of the advertisement for bids was attached. One section of the road was to be built from Mendota to the Cannon River with a bridge over the Vermillion River. The distance was "36½ miles, more or less." A second section was to be built from the Cannon River to Red Wing, "17½ miles more or less." "The probable amount to be expended on each section will be \$4,000, more or less, as may be found expedient," the announcement said.

The plans called for opening a road 25 to 66 feet wide, all trees and brush to be cut down. A center strip was to be "cleared and grubbed, the holes to be filled up, and knolls levelled off. The roadway, in places requiring it, were to be embanked to such height as ordered, and to be 18 feet wide at the top. In places where ordered, these embankments were to have a foundation of logs laid close together and extending 18 feet across the road."

The contractors agreed to the following prices:

"Grubbing and clearing the center strip, including the filling up the small holes and levelling off the hillocks or small knobs, for \$50 per acre.

"Cutting down trees and brush outside the center strip for \$7 per acre.

"Earthwork including haul of 100 feet for 20 cents per cubic yard; over 100 and up to 300 feet, 23 cents per cubic yard.

"The corduroying or logging of the causeways for \$3 per rod lengthwise of the road.

"Timber and lumber in the bridge over the Vermillion River for \$50 per thousand feet board measure, the bolts for 26 cents per pound." The super-structure was to be of "pine, of a good quality. The pins to be of white or burr oak of the best quality and well seasoned. The abutments may be of pine, white oak, red elm, rock elm, or black walnut." The kind of wood for other bridges and culverts was not specified, but the contractors agreed to furnish and install timbers for 15 cents per running foot, flooring for "15 cents per surface foot, the railing for \$50 per 1,000 feet board measure."



# Grading Mountain Highways *in* California



*Baffles in Stream Carrying Water for Grade Wetting at Williams, Calif.*

By  
O. H. Barnhill

**W**HEN Charles Harlowe was awarded the contract for grading 8 miles of roadway near Blairsden, California, he and his associate, Tom Harlowe, decided they would start right by providing machines adapted to this particular job. The excavation totaled 212,000 yards and the contract price was \$118,000.

The survey for this new mountain thoroughfare crossed a number of low foothills along the Mohawk Valley, a beautiful mountain vale bordering a headwater stream of Feather River, high up in the Sierra Nevadas. The ground was mostly sandy yellow clay.

In places there was shale and stony formation hard enough to require the services of a power shovel. A 1¼-yard gas-air Bucyrus-Erie excavator was assigned to this task, which it discharged very effectively. Two new International 4-yard 6-wheel Heil hoist motor-trucks took care of this part of the job to the entire satisfaction of drivers and contractors.

Since it would be a waste of time and power to load trucks with material which could be scraped directly from cut to fill, two Le Tourneau 7-yard scrapers were assigned to this task. These machines carried two-thirds of their burden on wheels, pushing the balance in front. They were loaded and emptied by the tractor driver with a power take-off.

These scrapers were dumped by pulling forward a gate in the back of the bowl, expelling the load in front as the machine moved forward and spreading material to any desired depth. The front wheels rolled under the tongue, making a short turning radius. One of these scrapers moved 700 yards per day, an average of 700 feet on a similar mountain job. A Le Tourneau rooter and bulldozer, together with three new 60-horsepower Caterpillar tractors and a Super Mogul grader, completed the machinery layout.

The Blairsden road was built under the supervision of the U. S. Bureau of Public Roads. The grade was 22 feet wide in fills, which allowed for a 3-foot shoulder on each side of the 16-foot portion to be hard-surfaced.

This strip was widened to 5 feet or 6.5 feet on the inside of curves. The cuts were 28 feet wide at the bottom, which gave room for a 3-foot ditch and shoulder of equal width on each side of the 16-foot pavement space. Like most of the newer California roads, there are no short curves on this section, most of the turns having a radius of 500 to 3,500 feet. A few are 300 to 350 feet, the sharpest 225 feet.

## SEQUENCE OF WORK

As it was difficult to use wheel machines on the steep slopes over which the right of way passes, a bulldozer was employed to level a track for the scrapers. Work began on the extreme upper side of a cut, instead of in the middle, and a notch was dug in the hillside.

The blade being adjustable, the upper end was tipped down, thus increasing the resistance to that side of the tractor. This enabled the upper track to dig into material sufficiently solid to push against. Otherwise the bulldozer would have had a tendency to slide downhill, away from the upper line of the cut.

It was found best to start fills by dumping dirt at the extreme lower edge, because this provided a level track for the scrapers and finished the grade as it was built up. Instead of depositing material in piles, it proved more desirable to spread layers from the beginning.

When mounds were made in unloading, their uneven outer edges were smoothed off afterwards with a bulldozer or other implement. The sloping sides of such piles rendered it difficult to run the scraper close enough to the edges of the grade to dump additional loads there. When, however, dirt was spread in level layers as it was forced off the scraper, a little was pushed out beyond the edge of the blade, which could be run near enough to the edge of the fill to build up the grade clear out to the stakes.

The rooter was found to work best by running two



A 7-Yard Le Tourneau Scraper and Caterpillar Sixty Tractor at Blairsdon, Calif.

standards deep in the ground, instead of three near the surface, because the former method required less power in proportion to the amount of earth loosened. The points also were kept sharper in deep rooting, in which they wore mostly on the under side, instead of the upper, as in shallow scarifying. On the second round, one of the standards split the ridge left between the two V-shaped trenches previously broken up.

The Caterpillar Sixty which pulled the rooter also pushed the bulldozer. The grader had a side-wing attachment to the blade which proved very useful for sloping cut banks. High slopes were finished accurately with this machine, very little hand labor being needed.

#### A COLUSA COUNTY JOB

Similar methods and machines were used by R. G. Le Tourneau in grading 8 miles of mountain road on the new Williams-Ukiah highway in Colusa County, California. This job involved 240,000 yards of excavating at 35 per cent, the total contract amounting to \$140,000.

#### HANDLING WATER FOR GRADE WETTING

The unique water system devised for grade wetting attracted the attention of other contractors who bid on

this job. By running water 6 miles through an open ditch, instead of iron pipe, the expense was reduced from \$8,000 to \$150.

Water was drawn from Bear Creek, the only available source of supply, by a Domestic 100-gpm plunger-type pump powered with a 35-horsepower Continental gas engine. The water was forced against 300-pound pressure to a height of 400 feet through 10,000 feet of 3-inch iron pipe.

Water was first run down the dry bed of Salt Creek, which closely follows the right of way of the new road. This method proved impracticable, because of excessive losses from evaporation and seepage.

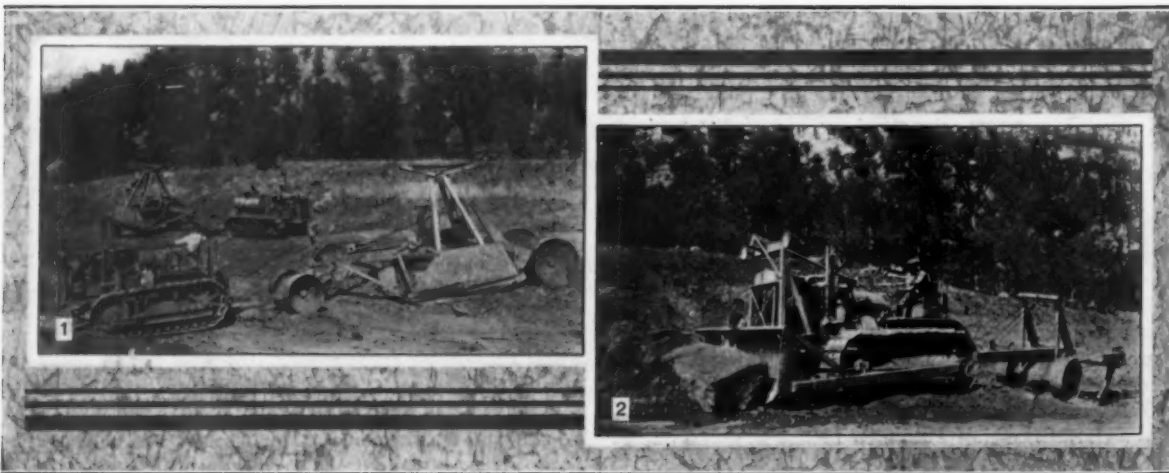
The Caterpillar grader was used to open a small ditch at one side of the road grade, being extended as the latter was lengthened. Erosion was negligible where the grade was less than 4 per cent. On down grades of 4 to 6 per cent a series of checks or baffles were put in. These consisted of earth dams a foot high quickly thrown up with a hand shovel.

Water was carried over the barriers through short sections of old iron pipe or over chunks of wood. Short pieces of small logs were cut from trees removed in clearing the right-of-way and a notch made in one side to receive the stream.

Near the lower end of the grade section being built, a small dam was thrown across the ravine with the bulldozer. As the grade was extended, additional barriers were quickly constructed in suitable locations.

Water was lifted from the dam with a 100-gpm single-cylinder double-action piston pump powered with a Durant motor. The water was forced through 1,000 feet of 2½-inch fire-hose, to which 1-inch lines were attached for wetting down the grade. Surplus water escaped through a faucet and was by-passed through a spillway to the streambed below, which conveyed water to the next reservoir. Only 10 per cent of the water was lost by evaporation.

In some places the ground was quite rocky, containing stones 2 to 3 feet across, yet with only three units of equipment—two scrapers and a rooter-bulldozer—40,000 yards per month was excavated by two 8-hour shifts. This record constitutes striking proof of the advantage of using suitable machinery.



GRADING ON THE WILLIAMS-UKIAH HIGHWAY IN COLUSA COUNTY, CALIF.

1. Caterpillar tractors and Le Tourneau scrapers which moved 40,000 yards a month.
2. The rooter and bulldozer that rid the grade of stones up to 3 feet in diameter

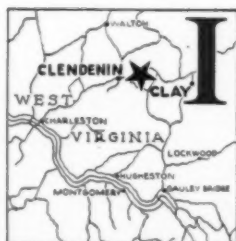
# Novel Features of a 2-Strip Concrete Paving Job in the West Virginia Mountains



*An Erie Steam Crane Loading  
the Bins Over the Batchers  
and Mixer*

*Central Mixing Plant  
Unique Batchers Set-up  
Turntable Beside Finished Grade*

*Traffic Drove Over Turntable  
Only One Finishing Machine  
Burlap Carried in Rolls*



**I**N its first trial of a central mixing plant for a concrete paving project, the Louis des Cognets Co., of Lexington, Ky., developed a number of very interesting and novel devices and methods and a particularly good batcher plant layout. While some of the schemes did not work entirely satisfactorily at first, the "bugs" were gradually eliminated as the work progressed and before the end of the first ten days every part of the paving operation was working smoothly.

## MUCH REGRADING NECESSARY

Project 3231, from Clendenin to Clay Road on West Virginia State Route 13, was graded previously under another contract. Before the 18-foot concrete pavement could be laid over the 9.89-mile grade it was necessary for the contractor to do considerable rough regrading even before the final grade operations could be started. The cause of this was primarily the redesign of the profile of the road after the original grading contract of several years previous was completed.

The regrade cuts amounted to from 6 inches to 8 feet and required the use of two portable air compressors,

both Ingersoll-Rand machines, one mounted on a White truck and the other on standard steel wheels. I-R jack-



*The Central Mixing Plant, Showing a Truck  
Being Loaded*





*Dumping a Load of Two Batches on the Subgrade*

hammers were used. About  $3\frac{1}{2}$  tons of Atlas 60-per cent gelatine dynamite were used in removing the rock necessary for regrading. Two Erie steam shovels with  $\frac{3}{4}$ -yard and 1-yard buckets loaded the excavation into a fleet of eight  $3\frac{1}{2}$ -ton Mack trucks equipped with steel bodies and Heil dump body hoists. In addition there were eight teams with slip scrapers on the rough grade to move shallow cuts. The rough grade was loosened by a Killifer scarifier drawn by a Monarch tractor and a Huber 10-ton steam roller was used to compact the fill. The grade was trimmed with an Adams No. 14 grader with a 12-foot blade pulled by a Monarch 75. The labor required was an average of twenty-five men with a maximum of thirty-five in the rock work.

#### A FIRM, SMOOTH FINE GRADE PRODUCED

The fine grade and form setting crew consisted of about sixteen men with four men lining up the forms and two men back with a scratch-board checking the grade ahead of the concreting. The fine grade was quickly and effectively put into shape from the rough grade by a Caterpillar-Russell Twenty patrol grader, which also approximately cut the trench for the Blaw-Knox 7-inch forms. Four men of the form setting crew followed with picks and hand shovels to trim the trench.

After the forms were set a Buffalo-Springfield 2-ton gas roller with a 6-foot grader blade and a compressed-air scarifier graded between the forms, throwing the excess dirt to the forms and compacting the grade. The

dirt was shovelled over to the shoulder by hand. The forms were set 9 feet apart as the 18-foot road was poured in two strips. One team and one man with a Western rotary scraper were kept back on the fine grade to remove dirt or bring in fill where the grade was low.

#### WELL-PLANNED LAYOUT FOR CENTRAL CONCRETE MIXING PLANT

The central concrete mixing plant was located on a railroad siding 4 miles from the Clendenin end of the job and about 6 miles from the Clay Road end and about 1,500 feet off the right of way. Both sand and gravel were received by rail from Pfaff & Smith of Charleston, W. Va., the two aggregates being from the Ohio River. Gravel was shipped in hopper-bottom cars and was dumped into a pit from which the Erie steam crane clammed it out with a  $\frac{3}{4}$ -yard Blaw-Knox bucket. The sand was received in gondola cars and unloaded by clamming direct from the car with two men in the car to clean up.

Two large stockpiles were maintained behind wood barricades to keep the piles shipshape. A Blaw-Knox weighing batcher plant was set up on cribbing to permit the installation of a Smith 27-E paver without boom, bucket, or skip underneath, with a hopper and chute to the paver drum.

Cement was also received on the spur track and unloaded by hand trucking direct from the car down an inclined runway to a large wooden platform mounted on timbers to prevent water reaching the stock of bags. There were usually two men in the cement car. A chute was used from the car to the platform when storing the cement. The whole pile of bags was protected at all times by a large tarpaulin. The bags of Lehigh cement were delivered to the batcher platform by a Barber-Greene portable conveyor with a LeRoi engine. The cement was loaded onto the conveyor by three men, who were the same crew that trucked it from the car to the platform.

Two men on the batcher platform received the cement, one of them opened the sacks and another picked up the sacks. Two other men emptied them as needed into the cement hopper, 7 bags to the batch. One of these men tripped the hopper when the batcher was emptied.

There was one man on the weighing batchers for sand and gravel, and one man operated the discharging device and kept the time on the batches and a check on the number of trips of each individual truck. The batches were made to approximate a  $1:1\frac{3}{4}:3\frac{3}{4}$  mix and had 1,360 pounds of sand and 2,450 pounds of gravel for the 7-bag batch. One man was kept at the spout of the paver to clean out the chute each time a batch was dumped into the trucks as the batches were very dry when dumped. The water in the batch, however, rose to the top as the trucks hauled the maximum of 6 miles to the far end of the job over a rough grade. The batch was given a one-minute mix after all materials were in the drum.

#### WATER FOR MIXING AND WASHING

The water supply for the mixer was secured from the Elk River, about 800 feet distant. A Gould triplex pump mounted on a trailer with a steering axle and a LeRoi engine driving it through a belt, delivered the



water through a 2-inch pipe. A relief valve was installed at the pump.

A cut through a slight rise in front of the batcher plant formed a driveway for the trucks to reach the paver and eliminated the need of excessive cribbing for the batcher. The trucks turned in an open space near the batcher and then backed to the paver. On each trip the bottom of the truck was sprayed by a  $\frac{3}{4}$ -inch hose with nozzle attached. This was within easy reaching distance when a truck was spotted to receive the concrete.

#### THE HAULING FLEET

The fleet of trucks for hauling the mixed batches consisted of eight  $3\frac{1}{2}$ -ton Mack trucks with dual rear wheels and Sieberling pneumatic tires. The metal bodies were equipped with a novel device to insure complete and quick dumping of the two batches which were carried on each trip to the finished grade. A piece of sheet iron about 12 inches narrower than the body of the truck and about 24 inches shorter was placed in the bottom and attached to the front of the body by two 18-inch chains. When the truck was dumped on the grade, first the gate opened and a little of the rather stiff mix fell out, then as the angle of dumping increased some of the concrete slid out over the heavier mass below. Finally as the critical angle of the dump was reached, the entire false bottom with the remaining mass of concrete slid toward the back and when the limit of the 18-inch chains was reached the false bottom stopped short with a jerk and threw out the concrete, cleaning the truck bottom. A short piece of tarpaulin attached to the top of the bed and lapping back on the sliding plate prevented concrete sticking in the front corners of the truck body.

#### SCHEME FOR TURNING THE TRUCKS

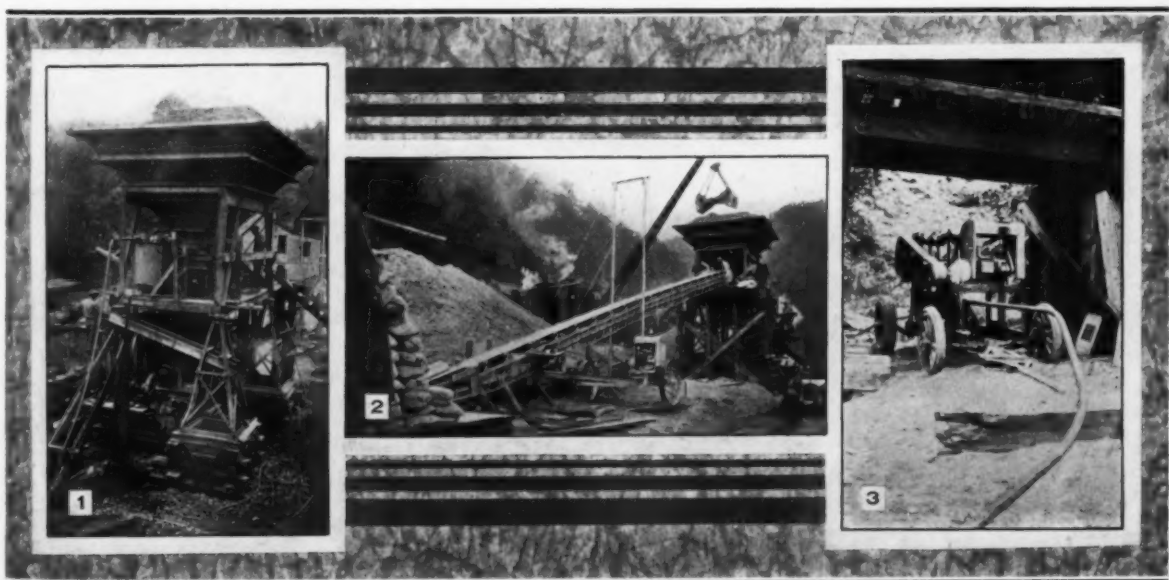
For a time, at the start of the pouring, the trucks turned outside the forms and backed through and rode



*One of the Erie Steam Shovels on the Heavy Regrading*

up onto two 15 x 4-inch timbers to dump. This method was used only until the specially designed Blaw-Knox turntable was completed and delivered. This turntable was so designed that the trucks could drive on and off at either end. In addition it was equipped with four roller-bearing wheels, so that it could easily be pulled along the grade by the trucks after they had dumped their loads. The turntable was put on the outside strip or on the previously poured slab where traffic had to be maintained and all vehicles drove over it in passing the paving. This worked out very well as traffic had very little trouble negotiating the crossing of the turntable.

In delivering the concrete, the trucks would drive on to the turntable, be turned one-quarter by four men and the truck dumped direct onto the subgrade, then turned another quarter turn and the truck driven off. The truck would then be hooked up with a chain attached



#### THE CENTRAL MIXING PLANT

1. The Blaw-Knox bin mounted on cribbing to permit the installation of the batchers and the Smith mixer below.
2. The Barber-Greene portable conveyor which carried the cement in bags to the batcher platform.
3. The CH & E triplex pump which supplied water for the mixer and for wetting down the truck bodies

to the front of the turntable and the turntable pulled ahead on the 9-foot strip the 23 feet which two truck loads of concrete would complete. There is no doubt but what the use of this turntable should be credited with the speed of production on this job as it enabled the central mixing plant to work to capacity throughout the day.

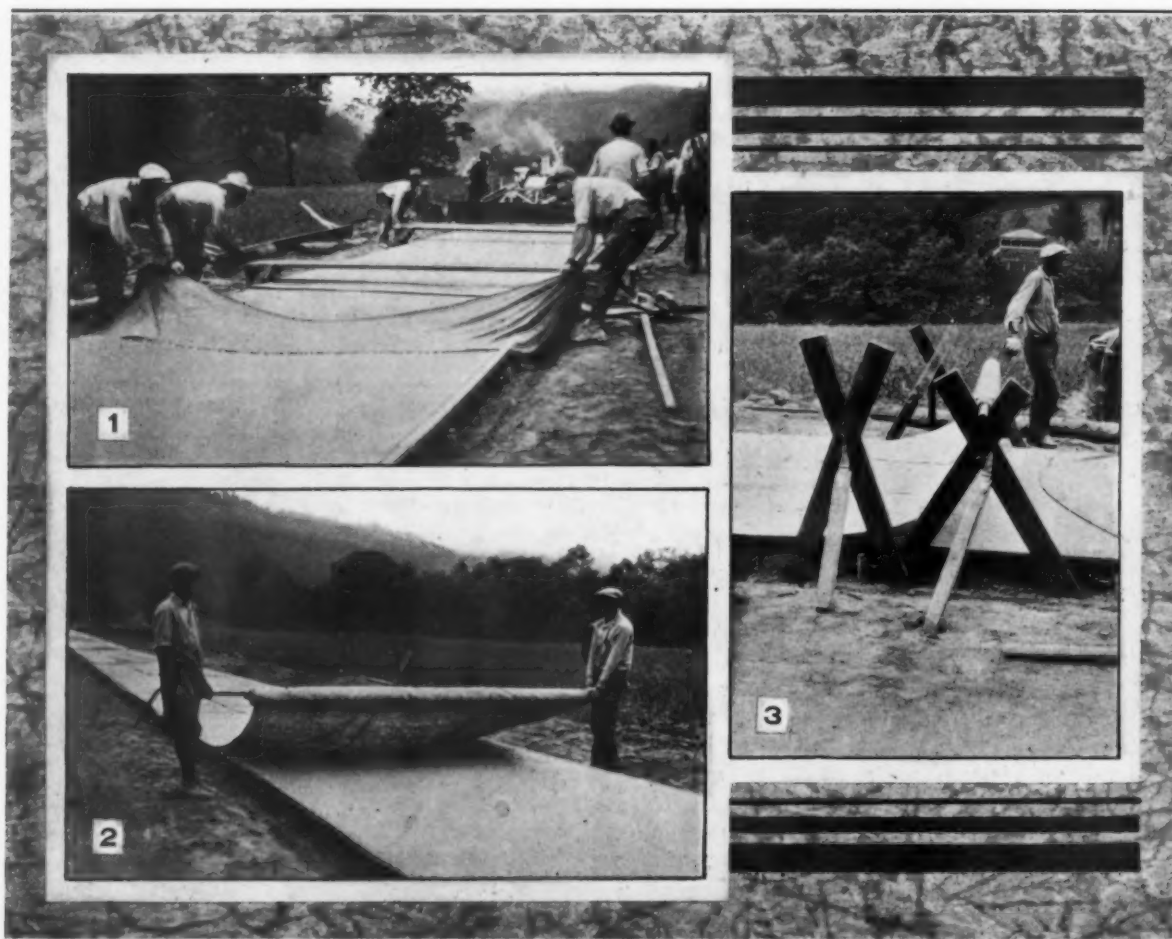
The State Highway Department ruled out the use of 4 x 4-inch timber sleds which were used in the concrete to hold up the steel fabric and after trying several other devices, it was decided to alter an old Lakewood finishing machine so that it was possible to strike off the concrete at two different elevations. The Lakewood was pulled along the forms by a 10-ton roller which was not in use at that time as the old machine did not have sufficient power to handle the work required of it in this case.

The steel was placed at mid depth of the slab. A 3½-inch extension was attached to the bottom of the Lakewood screed and this made it possible to strike off the concrete in the first layer 3½ inches deep. The trucks dumped directly on the subgrade in front of this machine and the roller pulled it forward with the screed down on the forms until all of the concrete was spread to the 3½-inch depth, then the roller was backed up

and the two spreaders and the two men operating the Lakewood pushed the machine back to where the concrete had its full thickness, and in the meantime the steel was laid and another truck dumped and the same operation repeated with the screed held up by its levers to allow the concrete to fill to the tops of the forms. This concrete could be struck off at any height. If the concrete was piling up on the Ord machine which was used to finish the top, the concrete was spread thinner by the Lakewood, or if there was not enough concrete the Lakewood screed was lifted. Two cutters were worked in front of the Ord. As much as 2,885 feet of 9-foot slab was poured in one day. On the last 5 days, 2½ miles of paving were laid, averaging a half a mile a day when only one finishing machine was used, with time to spare.

Two men behind the finishing machine used a 12-foot longitudinal float from two lightweight single bridges. Then came the three hand finishers who edged, floated and straight-edged the concrete. When the slab was satisfactory it was given a burlap finish by two men dragging a piece of burlap over the slab. These two men also laid the burlap for the first part of the curing operations.

(Continued on page 80)



#### BURLAP HANDLING IN FINISHING AND CURING

1. Pulling a piece of burlap over the finished concrete to slightly roughen the surface. 2. Spreading a 10 x 50-foot strip of burlap over the slab—the first step in curing. Note the ease of handling the burlap on the pipe rolls.
3. Supports for the pipe rolls of burlap

# Minimizing Your Income Tax

By

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*Certified Public Accountants*

*New York City*

**A**VOID paying unnecessary income taxes. Uncle Sam doesn't want one penny of tax to which he is not entitled. We say "avoid" taxes with particular emphasis on that word as distinguished from the word "evade." The distinction between these two words is evidenced by the decision in the case of *United States v. Isham*, (Reference 17 Wall—496,84, U. S. 496 for those who care to read the text of that decision).

The Treasury Department expects properly advised individuals, partnerships and corporations to avoid paying taxes which would otherwise be assessed through failure to take advantage of entirely permissible reductions of income through the application of approved rules in reporting.

The problem is therefore one primarily concerned with accounting records. Hardly a day goes by, but

we are asked for our opinion upon this or that business proposition. When we make decisions for our clients or render opinions as to the advisability of planning in a certain manner, our judgment is based not alone upon whether or not it is a good business deal—but also, what effect it will have upon our client's liability for income taxation.

Much has been written relative to tax avoidance and tax minimizing through the employment of competent counsel at the time of negotiating business deals. It is not the purpose of this article to discuss the possibilities of these initial tax-saving measures other than to commend the practice as being sound business and a procedure that should be more universally adopted.

## THE PREPARATION OF THE TAX RETURN

The method of account keeping determines the profits to be reported. Sound accounting practice, approved by Federal tax regulations, dictates the thought that the books of a contractor should be kept in such manner

as to, within themselves, indicate fully the status of all contractual relations, both signed contracts receivable and signed sub-contracts payable. Many contracting organizations fail to take book cognizance of the change in their financial position with the signing of contracts, a matter that will be made the subject of a subsequent article.

The books of records should be kept in such manner as will enable the determination of profits upon either or both of the following two bases: (a) Completed contract basis; (b) Percentage of completion basis.

## DETERMINATION OF BASIS FOR CLOSING BOOKS AND ASCERTAINING EARNINGS

It is necessary to give consideration to present taxation rates, probable future

tax rates, constancy of business volume, the nature of the organization—sole proprietorship, trust, partnership or corporation—exemptions, dividend requirements, and the voting of salaries to officers, before definitely fixing upon a basis for the determination of taxable profits in the interest of saving upon taxes, both income and state franchise, the latter principally

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*This is one of a series of twelve articles to appear monthly during 1931, to be prepared by Mr. Gregory, covering tax and accounting problems, as applicable to the contractor.*

*Particular problems relative either to methods of accounting or tax matters may be directed to CONTRACTORS AND ENGINEERS MONTHLY, 470 Fourth Avenue, New York. The problems will be discussed promptly in these pages without reference to the company making the request.*

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affecting corporations.

It is evident that it is not sound policy to save taxes, by having deferred the earnings, this year and in the following year or years be required to pay in taxes, less interest saving, more than would have been assessed in both years through the adoption of the proper basis.

It is illogical to establish a set rule as the problems of all taxpayers differ in certain aspects.

## EXPLANATION OF METHODS ACCEPTABLE TO INTERNAL REVENUE DEPARTMENT

**Completed Contract Basis:** In the determination of gross profits upon a completed contract basis, neither the receipts or requisitions on contracts in progress at the time of determining profits nor the cost expenditures thereon, to such date, are to be considered as profit or loss items. The entire contract and extra figure is withheld from gross income under a balance sheet caption which may be termed "Reserve Covering



Uncompleted Contracts," until the final requisition is dispatched.

The entire direct costs, labor, direct superintendence, materials, supplies, sub-contracts requisitioned, equipment hired, depreciation on tools and equipment, etc., are likewise deferred under a balance sheet caption which may be termed "Cost of Contracts in Progress" until the contract has been requisitioned finally, upon which date both balance sheet accounts are made a matter of profit and loss computation by transfer to "Gross Income for Completed Jobs" and "Costs of Jobs Completed," respectively. Canadian Law allows the establishment of a provision to cover contract guarantee contingencies.

**Percentage of Completion Basis:** In the determination of gross profits upon a percentage of completion basis, it is suggested that engineers' or architects' certificates be obtained in indication of the percentage of contract completed. Other evidence may be used to indicate this percentage, such as architects' or engineers' approved requisition amounts compared with the total contract amount, total cost to date compared with estimated total costs. For example, a \$1,000,000 contract, originally estimated to cost \$850,000 with \$375,000 requisitioned to date, and on which the costs to the close of the fiscal tax year have equalled \$350,000 and covering which it is decided from architect's or engineers' certificates that 40 per cent of the contract is completed, would be taken into gross income as follows: 40 per cent of total contract = \$400,000 less costs to date \$350,000, making a gross profit of \$50,000.

It is the opinion of the writer that in the instances where engineers' or architects' certificates are not obtainable as to the percentage of completion, the data at hand may be utilized in substantiation of an estimated percentage as follows: cost of work in progress to date plus the total of amounts requisitioned on the contract, assuming that work is requisitioned currently, divided by the total of the contract to which is added the total estimated costs of entire job. Taking the above job as an example and assuming that the total costs are now reestimated at \$890,000, the percentage might be derived as follows:  $\$350,000 + \$375,000 \div \$1,000,000 + \$890,000 = 38 \frac{1}{3}$  per cent.

#### REGULAR TAX ALLOWABLE DEDUCTIONS FROM GROSS INCOME

From the gross profits as determined, whether there are any gross profit or loss computations or not, it is permissible to treat as allowable deductions all indirect and administrative expenses, including a fair amount for officers' salaries as voted in the case of corporations together with the financial expenses applicable to the period. Reported business losses may of course be carried over as deductions for taxable income in succeeding periods as outlined in the tax regulations. For example, assume that the total of the indirect administration and financial expenses of the above corporation equal \$24,000 to the close of the fiscal period with the contract still in progress. If the return of income is filed upon a completed contract basis, the reported income will be a net loss of \$24,000; if filed upon a percentage of completion basis, accepting the engineers' estimates, there will be a reported net income of \$26,000 subject to tax.

#### GENERAL REMARKS

As a certified public accountant, the writer generally favors the keeping of records upon a completed contract basis, estimating profits periodically without changing the accounts in any way and taking book cognizance of profits or losses only upon completed contracts.

As a student of taxation, it is not possible to adhere in all cases to what might be termed the more conservative accounting practice, the principal object naturally being the minimizing of tax liabilities over a series of accounting periods.

#### It's the Little Things That Count

(Continued from page 65)

course of a year, which has been demonstrated, that he can well afford to buy a new engine for the paver each year.

Three Milburn carbide lights were kept on the grade to furnish plenty of light for the men who have to work late on the grade, sprinkling the burlap or greasing the paver.

#### PERSONNEL

This job was built by Sherman & Rhodes of Lewis-town, Penna., with David B. Owens as Superintendent. B. W. Yarrison was Chief Inspector for the State Department of Highways. Much credit was due to the Superintendent for the teamwork and spirit of the contractor's organization.

#### Novel Features of a 2-Strip Concrete Paving Job in the West Virginia Mountains

(Continued from page 78)

##### BURLAP CARRIED ON PIPE ROLLS

The burlap for curing was carried in 50-foot strips rolled on a 2-inch pipe roller with a 12-foot piece of 1-inch pipe through it to carry it by and to allow it to unroll. This roller was supported above the slab, before being placed, on X-shaped timbers with a third leg hinged on to make them stand alone as shown in one of the photographs. When the end of the strip of burlap was reached it was tied down to the forms so that the wind could not blow it up and expose the green slab.

##### CURING

Silicate of soda was used in curing. It was applied by two men with sprinkling cans and brooms. When tests showed a strength of 3,000 pounds per square inch usually in about 14 days, the slab was opened for traffic.

Water for sprinkling the subgrade and burlap was supplied by a C H & E pump from Elk River through a 1¼-inch pipe with taps for the hose every 250 feet. Three service trucks were maintained on the job. One truck with a tank to supply the Erie steam shovel on the rough grade, a truck with a side-board body for general hauling and a flat bed truck without side-boards for bringing up forms and for work out on the grade.

#### PERSONNEL

This contract was awarded to the Louis des Cognets Co., of Lexington, Ky., for \$275,290. The work was in charge of R. O. Cochran, Superintendent. C. M. Glisan was Inspector in charge of the work for the State Road Commission of West Virginia.



# Novel Sand-Asphalt Plant Set-Up



**I**N addition to building over 9 miles of sand-asphalt pavement on Cape Cod this last summer, in two projects, the Lane Construction Co. had the novelty of operating a miniature piggery to dispose of the garbage from the boarding house where 25 to 30 men from the plant and road gang were cared for. The piggery started with three young pigs and ended with the same three, much larger in size at the end of the season, proving that the life of the construction camp pig is a healthy one.

The major project extended along Route 6 from East Dennis toward Orleans, a distance of 8 miles, and was a resurfacing and widening job over the old 18-foot penetration macadam, extending it to 24 feet with a base and surface course each of 2 inches thickness. As the old pavement was not laid to the present standards of crown and smoothness there were many spots where the base course of the new pavement was not required on one side and was feathered out from the far side. In all cases, however, the surface course, which was of the same mix as the base, was laid the full 2-inch thickness.

The secondary project was located on one of the roads running across the Cape from East Dennis and was only 18 feet wide with the standard 2-inch base and 2-inch top for the resurfacing. This job was located about 1 mile from the west end of the longer project and was only 1.25 miles in length. There was little grading on the East Dennis job, the extra haul from the asphalt plant being the only feature of this job that made it differ from the longer project.

## GRADING AND WIDENING ON THE BREWSTER PROJECT

Work on the grading was started the middle of April, 1930, and the first mixer began producing for the road the first of May. The second mixer was started the first of July. The East Dennis job was completed as far as paving was concerned on August 6, the paving on

*Lane Construction Company*

*Operated Dual Plant*

*at*

*Brewster, Mass.*

*with Tom Thumb Piggery*

*As a Side Issue*

the Brewster job on September 9 and the final completion of the shoulders on October 1.

The excavation ran about 21,000 yards which went into fill on the new locations and cut offs. On the fills a Warco Road Hog was the only piece of grading equipment used. There were 3,300 yards of borrow of earth, 7,300 yards borrow of sand, 4,250 yards of trench excavation and 8,800 yards of clay borrow. A Northwest shovel with a 1-yard bucket handled the major excavation while an Insley  $\frac{1}{2}$ -yard shovel handled the light cuts and all of the trench excavation was done by a Universal truck crane. There was over 1 mile of drain pipe installed on the job, the reinforced concrete pipe ranging from 12 inches to 36 inches in diameter and the vitrified clay pipe from 10 inches to 15 inches. There was a second  $\frac{1}{2}$ -yard Insley excavator in the sand pit for the borrow.

In the widening of the right of way for the Brewster project all sections of clay were excavated to 12 inches below the subgrade and then backfilled with 8 inches of sand and 4 inches of loam or clay "hardening," as this material is called locally. It was possible on this work to have some of the trucks hauling clay in one direc-

tion and having a return load of sand. The contractor hired all of the trucks for the hauling of the excavated material, except two 3-way dump trucks owned by the organization. These Commercial 3-way trucks proved of great value in handling fill at the plant when the railroad siding was built and along the shoulder in filling the excavated trench where the clay had been removed. They could run alongside the trench and dump to either side, whereas the end dump trucks would frequently drive just a bit too far in backing and would be hung up with their rear ends in the trench. There were six trucks hauling excavation, and one utility truck which put out the lanterns and hauled gas and oil to the machines on the road.

#### FORMS SET BY SMALL GANG

Asphalt was laid on the road by three gangs, two on the Brewster job and one on the East Dennis job. For each laying gang there were three men who set and lined up the forms made of 2 x 4's in random lengths, laid with the 2-inch side vertical and staked at the center with an iron pin 1 inch in diameter and at the junction of the forms where two pieces butted together, a short piece of 2 x 4 about 6 inches long was set with a single pin. This is a considerable saving over the older method used in Massachusetts where pins were placed at the center and both ends of each piece.

When base was being laid there was frequently no need of forms at the center where the old penetration macadam was high and at such times, as there were no forms used at any time on the edge when laying base, the form setters would throw up a shoulder at the edge to give protection to the hot mix when it was dumped there.

In laying top, forms were used at both the center and the edge except when the second 12-foot strip was being laid and then the edge of the first strip at the center was used as a form.

#### IDEAL LOCATION FOR ASPHALT PLANT

The pair of hot mix plants supplying the sand asphalt for these projects was located at Brewster, about 1.8 miles off the road at a point near the center of the work. This gave hauls of 1.8 miles plus 3.5 miles maximum for the Brewster job and a maximum of 7.55 miles for the East Dennis job. Hauling was all handled by hired trucks which were paid for hauls to two zones on either side of the center point of the job and an extra payment for all loads delivered to the East Dennis job. The trucks hauled from 16 to 20 batches of 1,000 pounds each per load according to the size of the truck.

The initial work in setting up the pair of sand asphalt plants was to provide a railroad siding for the handling of the asphalt, stone screenings, fuel oil and coal for the plants. A fill built on a 1:1½ slope and brought up to a peak just wide enough for the single track spur was made, using the 3-way dump trucks. At first on the relatively wide base any type of truck could have been used but as the fill narrowed an end-dump truck would have been useless and a tractor with a bulldozer would have been in the way. The fill was 37½ feet high and had a capacity of seven cars. The 7,000-yard fill for the railroad siding was made from the stripping of the sand pit; thus it was possible to charge off the cost one-half to the pit and the other half to the plant.

At about three car lengths from the end of the fill a trap was built under the track and a short belt conveyor inserted to unload the stone screenings or dust to side-hill storage behind a bulkhead. A gate in the bulkhead permitted one man to control the flow of the screenings to the bucket elevator to the drier of the first of the two Cummert asphalt plants. In order to provide dust for the second plant that was set up at right angles to the first, a belt conveyor powered with a LeRoi engine was set up half way up the stockpile. A hopper at the end was either supplied with screenings by one or two men shoveling to it when the stockpile was low or an ordinary coal chute was used to chute the dust direct from the unloading conveyor to the hopper of the conveyor leading to the stockpile for the second plant.

Sand was secured from an excellent bank beside the pair of plants by a LeClair scraper which pulled the sand as needed to a small stockpile close to the plants, using a Clyde hoist powered with a Waukesha motor. The sand was retained by a bulkhead with two openings, one to the pit beneath the cold elevators of each plant. Working on the principle that it is easier for a man to stop the flow of sand with a shovel at an opening than to try to make the sand flow, the gates were cut to a size sufficient for the sand to flow freely and one man at each gate with a shovel maintained a flow sufficient for the use of the plant. The slackline scraper worked out over a considerable length of pit and at times it seemed to be lagging in supplying the small stockpile. In order to overcome this condition the upper drum of the hoist which pulled the empty scraper back across the pit was built up with blocks of wood wired on to give it a larger diameter. Thus the return speed of the scraper was greatly increased.

An analysis of the labor required for the plants thus far shows one man in the car cleaning out the stone screenings; one man on the conveyor to the second plant assisted at times by the handy man who also worked on the asphalt line when needed in shifting to a new car; one man on the sand elevator and one on the dust elevator for each plant and the hoist operator who supplied sand for both plants.

Socony asphalt was received in 8,000 and 10,000-gallon tank cars on the railroad siding and heated by a horizontal boiler. The asphalt was then pumped by a Kinney steam-jacketed pump through a jacketed pipe line to the storage tanks at the two plants. Two men handled the fire and pumping of the asphalt.

A fuel oil tank of 12,000 gallons capacity was located on the fill near the asphalt pump but at an elevation such that the top of the tank was 18 inches below the bottom discharge pipe of the tank car. The flow from the car to the tank and from the tank to the two asphalt plants for the driers was entirely by gravity. The two plants used about 800 gallons of fuel oil per 10-hour day.

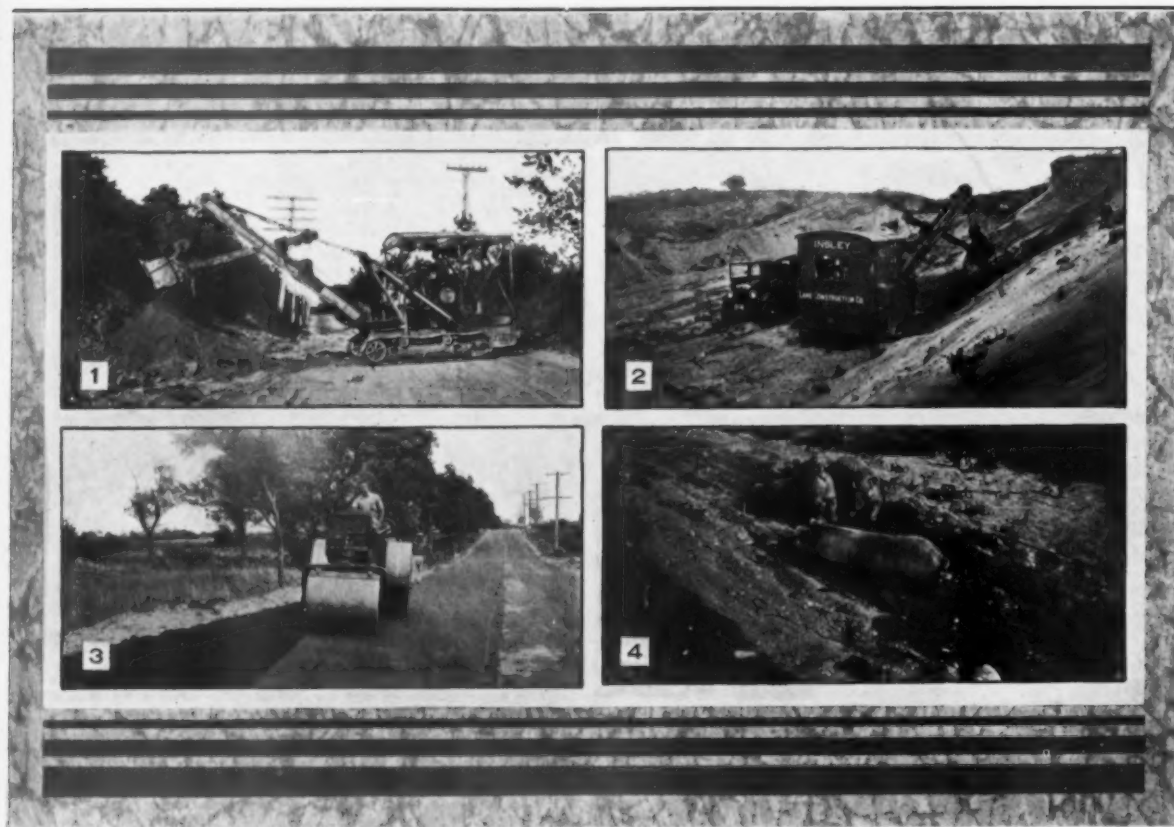
The labor for operating the plants proper consisted of a fireman, a foreman and two batcher men, one for the sand and screenings and one for the asphalt. So well coordinated were the crews that a batch of asphalt was being delivered fully mixed every 25 seconds from the smaller plant under optimum conditions. The two plants produced an average daily output of 500 to 550 tons per day.



**THE LANE CONSTRUCTION COMPANY'S SAND-ASPHALT PLANT SET-UP NEAR BREWSTER, MASS.**

1. The larger of the two plants as seen from the fill for the railroad spur. The second plant is directly behind the hot sand elevator. 2. The belt conveyor for unloading stone screenings from a pit beneath the track. 3. Two laborers shovelling stone screenings to the hopper of the second conveyor which carried it to the small plant. 4. Not exactly arduous labor, but important in correctly regulating the flow of sand and stone screenings to the bucket elevators. At the left is the stream of stone screenings from the second conveyor. The farthest man is on sand for the larger plant, the middle man on sand for the smaller plant and the nearest man on screenings for the smaller plant. 5. The sand pit with the Sauerman slackline cableway supplying sand for both plants, at left the smaller plant, center the larger plant, and at right the fill and spur track. 6. The asphalt bucket at the smaller Cummer asphalt plant with the asphalt delivery pipe discharging into the bucket





#### INTERESTING FEATURES AND OPERATIONS ON A MASSACHUSETTS SAND-ASPALT CONTRACT

1. An Insley shovel handling a small cut to widen the right of way for the new sand-asphalt surface. 2. Another Insley in the sand pit loading a Dodge truck with material for a shallow fill. 3. A Buffalo-Springfield 3-wheel gas roller compacting the base in long wide arcs. 4. Pigs in good clean gravel on a construction job. The trio which was fattened on the camp garbage

#### ASPALT RIG ON SMALLER PLANT

The smaller plant was the scene of an experiment in the handling of the asphalt to the weighing bucket and into the batch. The two plants were originally equipped with the same type of standard tip bucket which ran on an overhead trolley back to the asphalt valve where it was filled and weighed and then run forward 6 to 8 feet and emptied into the pug mill. One contractor that has come to our attention put a compressed air valve and piston on the bucket, so that by opening the valve the bucket would be pushed forward without tiring the operator. At the Lane Construction Co. job, the smaller plant had an arrangement so that the bucket remained stationary at the pug mill and the operator only opened a valve to fill the bucket to the required weight. A pump circulated asphalt from the heating tank through a loop of pipe with a valve on a 3-foot nipple leading to the bucket. The pump would simply pump the asphalt around the loop until the valve was opened and then that provided a path of less resistance and the asphalt flowed into the bucket. This very simple scheme speeded up the operation of the plant considerably. The larger plant was later equipped in the same manner after the first tryout had demonstrated its time-saving qualities.

The Cummer plants used an average of  $2\frac{1}{2}$  to 3 cars of screenings per day in the batches. The individual batches of hot mix were made up of 570 pounds of sand,

370 pounds of stone screenings and 60 pounds of asphalt for the 1,000-pound batches and half these quantities for the 500-pound batches of the smaller plant. The scheme of operation of the Cummer plants used was as follows: the sand and stone screenings were raised in the bucket elevators to the drier which was heated with the fuel oil fires as the material was cascaded through the drier. Then the dry material was carried up by the hot elevator to a screen which took out the oversize material and permitted the remaining material to go into the hot storage bin from which it was drawn and weighed before emptying into the pug mill.

A drilled 2-inch well was used as the source of water supply for the boilers. The water was pumped to a small tank on top of the hill above the plant and run by gravity to all the boilers.

The batch trucks were oiled as needed. Some required oiling before receiving each load and others were oiled every few trips. As each truck left for the job it was weighed by a State inspector as the payment for the work was by the ton of asphalt delivered to the road. A complete set of Fairbanks platform scales was installed by the contractor for this purpose. The best production for a 10-hour day was 600 tons. The entire labor organization on the job was a maximum of 160 men.

#### SPREADING AND ROLLING THE MIX

In the short haul zone 8 trucks were used for the two

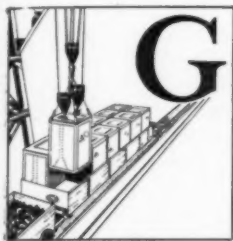
(Continued on page 86)



# Use of Containers

## in Handling Materials

## of Construction



**G**RATIFYING returns were realized by a Toledo contractor by utilizing bulk containers, the revolutionary freight handling device introduced by the New York Central Lines, in moving materials from a gravel pit and cement mill to a building site in the Ohio metropolis. While the

contractor had had no experience with containers he was quick to see their possibilities and to adapt them to his needs. Forty-three silos 145 feet high with a capacity for storing 2,100,000 bushels of grain were constructed last summer for the National Milling Co., at Toledo by the McDonald Engineering Co.

The accompanying photograph shows one of the two mixing plants which were used. The mixer is located

By

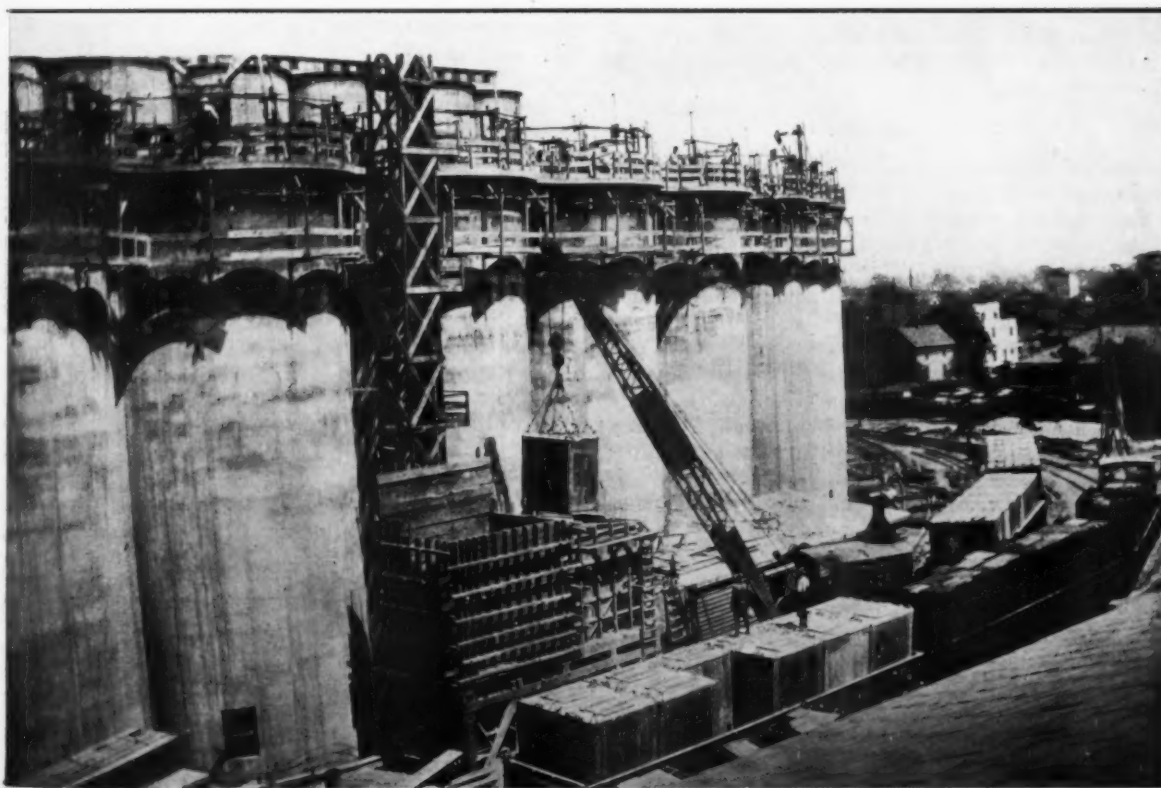
G. H. Ingalls, Jr.

*Container Traffic Representative  
New York Central Lines*

underneath the two adjacent hoppers, the larger of which was used for sand and gravel, while cement was handled through the smaller hopper.

By employing a locomotive crane it was possible to lift the container from the gondola cars, raise them into position over the proper bin where by releasing the chains the hopper bottoms of the containers were dropped, discharging the contents.

Two types of containers were used, the one waterproof and leakproof for bulk cement, the other non-watertight for sand and gravel. The non-watertight



*Locomotive Crane Handling Container of Cement from Gondola Car to Bin Over Concrete Mixer*

containers are coming into general use as the speediest and most economical means of moving common brick from the kiln to the job. Both types of containers have outside dimensions 4 feet 8¾ inches in width, 8 feet 4 inches in height, 7 feet 2½ inches in length, with a capacity of 210 cubic feet.

#### LOADING THE AGGREGATES

The sand and gravel was loaded at Jonesville, Michigan, 70.2 miles from Toledo. The containers were arranged in such a position that ten constituted a car, this being done for operating convenience. Loading was accomplished by conveyor belts, which discharged the sand immediately after washing direct into the containers. As the sand and gravel weighed approximately 100 pounds per cubic foot the containers could not be loaded to full capacity, 210 cubic feet, on account of load limit on the car axles. The containers were, therefore, loaded with approximately 7 tons each, or a total of 70 tons per car. The job required 384 cars or about 27,000 tons of sand and gravel.

#### CEMENT FROM THREE PLANTS

The cement was loaded at three different points, Bay Bridge, Ohio, Bay City, Michigan, and Universal, Pennsylvania, with most of it coming from Bay Bridge. Each car consisted of twelve watertight containers. As in the case of the sand and gravel the loading had to be limited in order not to overload the car axles. Approximately 5 to 6 tons were loaded into each container, giving the car a load of about 70 tons. Loading was accomplished through a so-called "mother nozzle" which was composed of six smaller nozzles, making it possible to load six containers at one time. An entire car of twelve containers could be loaded with 325 barrels of cement in 20 minutes. About 110 cars of cement were used.

#### SPEEDY CONSTRUCTION

The speed of construction called for 20 cars of sand and gravel, with 4 to 5 cars of cement per day.

Although there was considerable inclement weather, there was not a claim registered against the railroad on account of wet cement. This speaks well for the containers as an instrument which is practicable for handling such commodities.

The entire battery of 43 silos was completed inside of two months. Through the use of containers it was possible to conduct a 24-hour operation.

Had the cement for this job been handled in bags, considerable labor would have been necessary. Moreover, had the sand and gravel been handled in the customary way many men would have been employed and time consumed. By using containers the only labor required for handling the aggregate was an engineer, a crane operator and one laborer. A container could be handled in about three minutes which means that a car with 12 cement containers, 325 barrels, could be unloaded in 36 minutes as compared with 1 to 2 hours if handled in box cars.

As the construction of these elevators had to be completed prior to the time grain had to be stored, the contract stipulated a penalty of \$100.00 a day beyond the specified completion date.

Not only did the contractor avoid the penalty

through speed obtained with containers, but having contracted on the basis of cement in bags and actually handling in containers in bulk, he realized an additional profit through attending economies.

Containers are proving so efficient and so economical for handling aggregate going into the construction of buildings, as well as in road construction, that their use is rapidly growing. Such projects demand not only speed, but the additional economies possible only by utilizing containers to offset extra costs unforeseen by contractors.

#### Novel Sand-Asphalt Plant Set-Up

(Continued from page 84)

or three gangs which were spreading while in the outer zones 11 trucks were used. The hot mix was dumped from the trucks into windrows transversely on the 12-foot strips between the forms or lines laid out if base was being placed. It was then shovelled by two men and raked at once to an even texture and grade by three men. The same mix was used both for base and top and the contractor was able to average 1,000 feet of base or top per day per gang.

Four rollers were used on the hot mix, one 3-wheel Buffalo-Springfield 5-ton gas roller, two 8-ton Buffalo-Springfield tandem rollers, and one 8-ton Buffalo-Pitts tandem steam roller. This is perhaps the first sand asphalt job where the use of a three-wheeled roller has been permitted. It was used only on base as it left creases in the surface but these were not important in the base course. The 3-wheel roller gave a slightly higher compression, so was particularly advantageous on the base.

#### PERSONNEL

Credit for the ingenious set-up of the two sand-asphalt plants on this job is due to A. C. Woodhouse, Superintendent for the Lane Construction Co., Meriden, Conn. For the State Department of Public Works of Massachusetts the work was done under the direction of H. C. Holden, Division Engineer, with Ernest Hosback as Resident Engineer.

#### A Safety Idea from a Bay State Contractor

"**P**REACHING about safety counts for less than setting a good example. If a new man on the job sees that other men work unsafely when the foreman's back is turned he will do the same. It is a brotherly act to show the new man the safe way and save him the hard knocks." Leo D. Woedke, Manager, Protection and Safety Department, Fred T. Ley & Co., Inc., Springfield, Mass., one of the chief disciples of safety in the construction industry, wrote the words which open this article.

This same contractor has tried out a new stunt in pre-employment physical examinations for workers in the construction industry. It has worked out with considerable success in Connecticut. The examination is a simple one which never costs more than \$2.00 or \$3.00 and the physician naturally looks for the things which give the most grief in the construction industry where so much hard manual labor is involved. He looks for flat feet, arch or ankle trouble, charley-horse knees or floating or loose conical cartilages, hernias, heart trouble, bad tonsils with arthritic indications, usually in the knees or back, eyes, and in one case the company doctor is securing a Wasserman blood test and a urinalysis through the local state or city bacteriological office. The Wasserman, of course, is to locate a disease which brings plenty of grief on an open wound, and the urinalysis is for diabetes which of course, usually means the loss of a toe or foot on a foot injury.

# Costs

## and

# Methods

## on a

# Brick-on-Concrete-Base Highway

## in

# Niagara County, N. Y.



*The Finished Pavement Before the Shoulders Were Trimmed*

**B**RICK pavement has long been considered a durable and lasting road surface, but it has remained for Niagara County, N. Y., with the hearty cooperation of the contractors to produce a pavement, which even before its utter completion has merited the recognition of a nationally known brick authority as one of the finest brick pavements ever built. This road has invited the interest of all road builders, not alone because of its quality of design and construction, but in view of the fine progress made by the contractor.

### DESIGN AND QUANTITIES

Known as the Packard Road, County Road No. 82, it completes another route into the City of Niagara

By  
**Richard M. Rumsey**

*County Superintendent of Highways  
Lockport, N. Y.*

Falls, N. Y., and connects with the main county road from Lockport. The base is 6 inches thick with a 6-inch edging of 1 : 2½ : 5 mix concrete, the gravel and sand being Lake Erie material. The length is 3.82

miles, of which 1.38 miles is 42 feet wide with a granite curb, and the remainder 20 feet wide.

It has a total of 10,950 cubic yards of concrete base, 2,270,000 brick, 14,100 lineal feet of granite curbing and 22,900 cubic yards of earth excavation. Work was commenced by the contractors, Stapell, Mumm & Beals Corp., Hamburg, N. Y., May 17, 1930, and was completed November 1, 1930.

### NOVEL TRANSVERSE EXPANSION JOINTS

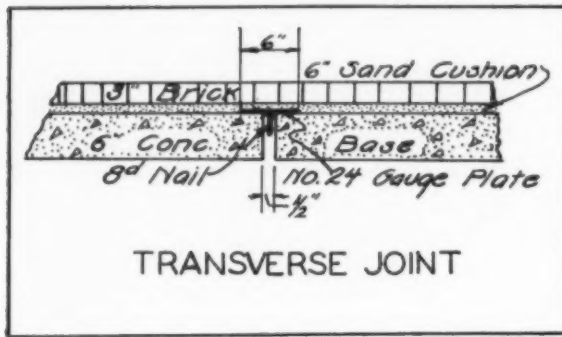
From an engineering aspect, the road has one departure from the usual design of bases. At approximately 100-foot intervals, a ½-inch steel plate was inserted during the pouring operations and pulled after the initial set of the concrete was attained, leaving an open joint between blocks. On placing the sand cushion a No. 24 gage galvanized steel plate was placed, as shown in the diagram, thereby leaving the space between the 100-foot blocks open. The original intention was that all expansion in the base could be taken up at the joints with no heaving of the brick course and at the same time minimizing the expansion cracks in the base.

Since the base was completed, small cracks have developed in the center of most of the 100-foot blocks, but where the block is 60 feet or less no crack has shown. This result would point to the use of approximately 60-foot in place of the present 100-foot blocks. Attention of the reader is called to the fact that no steel



*One of the Transverse Cracks That Developed in Most of the 100-Foot Blocks Between Expansion Joints*





was placed in the blocks.

Attention is also called to the advantage of an open expansion joint. Had the usual asphalt or tar joint been used, it would have been forced upward from the joint, thereby pushing sand cushion and brick upward, the result being a hump every 100 feet. With the open joint, expansion forces the base to slide under the plate with no effect on the wearing surface.

#### RAPID PROGRESS ON EXCAVATION AND BASE

The progress of the construction, due to fine weather and the excellent organization of the contractor, was exceptional.

The excavation was carried on by two  $\frac{3}{4}$ -yard Erie steam shovels, the hauling being done by trucks and mechanical mules. All hauling was within 2,000-foot balances.

During the excavation period, culverts, catch basins and curbing were built, and on July 15 the first paver went to work. On August 16 the last of the base was poured, during which time the first Ransome 21-E paver worked  $27\frac{1}{2}$  days and the second worked  $10\frac{1}{2}$  days, for an average daily yardage per mixer of 290 cubic yards.

#### CONCRETE OPERATION AND ORGANIZATION

1	Superintendent for both mixers.....	@ \$60.00 per week
1	Timekeeper for both mixers.....	@ 40.00 per week
2	Form setters.....	@ .60 per hour
4	Helpers.....	@ .40 per hour
1	Fine grade foreman.....	@ .60 per hour
15	Laborers (fine grade).....	@ .40 per hour
1	Laborer oiling forms.....	@ .30 per hour
1	Mixer foreman.....	@ .65 per hour
1	Mixer operator.....	@ 60.00 per week
2	Finishers.....	@ .75 per hour
2	Screed men.....	@ .50 per hour
2	Men spading.....	@ .30 per hour
5	Concrete men.....	@ .50 per hour
2	Men filling edging.....	@ .50 per hour
1	Man applying Curcrete.....	@ .50 per hour
1	Batch dumper.....	@ .60 per hour
8	Men hauling forms, etc.....	@ .30 per hour
2	Water boys.....	@ .25 per hour
1	Curcrete spray machine.....	
1	Service truck.....	

All fine grading was done by hand with a scratch-board built to span the forms.

#### CURING

A comparatively new method of curing was used. Instead of the usual hay and water, the concrete, almost immediately on placing, was sprayed with Curcrete, an asphaltic emulsion, to seal the surface of the concrete. This method of curing concrete has been used in the County for two years and has proved very satisfactory.

#### THE BATCHING SYSTEM

The batching of trucks was done in the Empire Builders Supply commercial gravel yard. Washed

gravel and sand was brought down the river in boats, rewashed and separated at the plant and then carried directly into the batching bins. The trucks received their load of gravel and sand first, and then moved to the railroad siding for their supply of cement. So well organized was the plant, that they were able to average 601 batches per 10-hour day during the pouring time when both pavers were operating. This batching system meant a great deal to the contractor, because for \$1.48 per ton he could have his material placed on trucks without tying up a crane and batching bins of his own, and because the plant had a huge capacity and little chance of shutdowns or delay in handling materials, thereby eliminating the element of chance to a large degree. As a result of this arrangement he had only to supply men to dump bins and handle cement.

Batches were hauled to the job under contract with a fleet of International trucks equipped with dump bodies. Dump bodies instead of batch boxes worked quite admirably, due to the allowable width of the forms. The minimum width of strips being 14 feet, trucks could pass anywhere on the grade and therefore caused no loss of time when changing trucks at the mixer.

#### CURBING

The curbing was a granite block 5 x 14 inches, and was set on a concrete base 12 inches thick and then backed up to a height of 5 inches with concrete. Under the concrete was placed a 12-inch course of pea gravel around a 4-inch drain tile. This curb was, of course, placed before paving operations were started. The granite was shipped to the job and cut by local stone cutters for \$1.20 per linear foot, including granite. The actual setting of the curb was sublet at 5 cents per linear foot. In addition the contractor used laborers at 35 cents per hour, and one foreman at 50 cents per hour for backing up the curb and placing the concrete base. The cost per foot of placing the drain tile and pea gravel course was 3 cents per linear foot and the digging of the curb trench was 3 cents. The above prices do not include material.

A total of 14,300 linear feet of curb was laid in 27 days for an average of 530 linear feet per day. Approximately 465 cubic yards of 1:2½:5 concrete were used in the base and backing up of the curb. To make the above amount 396 cubic yards of gravel and 241 yards of sand were delivered to the job at \$1.53 per yard.

In placing the curb, two 1-bag mixers were used to place concrete; one being handled by a gang placing the base, and the second being used to back up the curb after setting. The third gang of men was kept ahead placing the tile and pea gravel.

#### PLACING THE BRICK

In placing the brick course, the contractors made fine progress. They averaged 1,347 square yards of 20-foot pavement per day, with a peak day of 1,575 square yards. The brick were shipped to a siding in the middle of the job, and were hauled under contract by a fleet of pneumatic tired International trucks for \$3.50 per thousand. The brick were placed on the shoulder on a straw bed to insure the bottom brick from becoming dirty during rainy periods.

For laying down the 1-inch sand cushion, a mechanical Lakewood sand screed was used. The construction of the screed shows quite clearly in the photograph, except that the ends were carried on a wheel carriage that rode on the edging.

#### BRICK ORGANIZATIONS AND EQUIPMENT

1 Superintendent.....	@ \$10.00 per day
1 Timekeeper.....	@ 0.00 per day
1 Watchman.....	@ 5.00 per day
<i>On Sand Cushion</i>	
1 Foreman.....	@ .60 per hour
4 Men.....	@ .50 per hour
1 Lakewood screed.....	@ 4.00 per day
1 Truck and driver.....	@ 20.00 per day
<i>On Brick</i>	
2 Brick droppers.....	@ 1.25 per hour
1 Brick dropper.....	@ .75 per hour
1 Man straightening rows.....	@ .30 per hour
22 Men carrying brick.....	@ .30 per hour
2 Men cleaning brick.....	@ .30 per hour
5 Men replacing rejected brick.....	@ .42 per hour
3 Men battin in end brick.....	@ .50 per hour
1 Man sweeping brick.....	@ .50 per hour
1 Man rolling brick.....	@ .50 per hour
2 Foremen.....	@ .65 per hour
3 Men hauling asphalt and brick ahead.....	@ .40 per hour
1 Roller.....	@ 1.00 per hour
<i>On Filler</i>	
2 Men opening asphalt barrels.....	@ .40 per hour
2 Men on squeegee buggies.....	@ .40 per hour
2 Men operating heating kettles.....	@ .50 per hour
2 Men on hand squeegees.....	@ .40 per hour
2 Men carrying asphalt to squeegee buggies.....	@ .40 per hour
3 Men hauling and placing sand cover.....	@ .50 per hour
1 Ton truck.....	@ 1.50 per hour
2 Squeegee buggies.....	@ .50 per hour
2 400-gallon kettles with thermometers.....	@ .20 per hour
Small tools.....	@ .20 per hour
1 3-ton roller.....	@ 1.00 per hour
120 Gallons kerosene.....	@ .10 per gal.
5 Gallons gasoline.....	@ .20 per gal.

After the brick were in place, a 3-ton tandem roller was put over them before the asphalt was applied. Rolling was done from the edge toward the center at

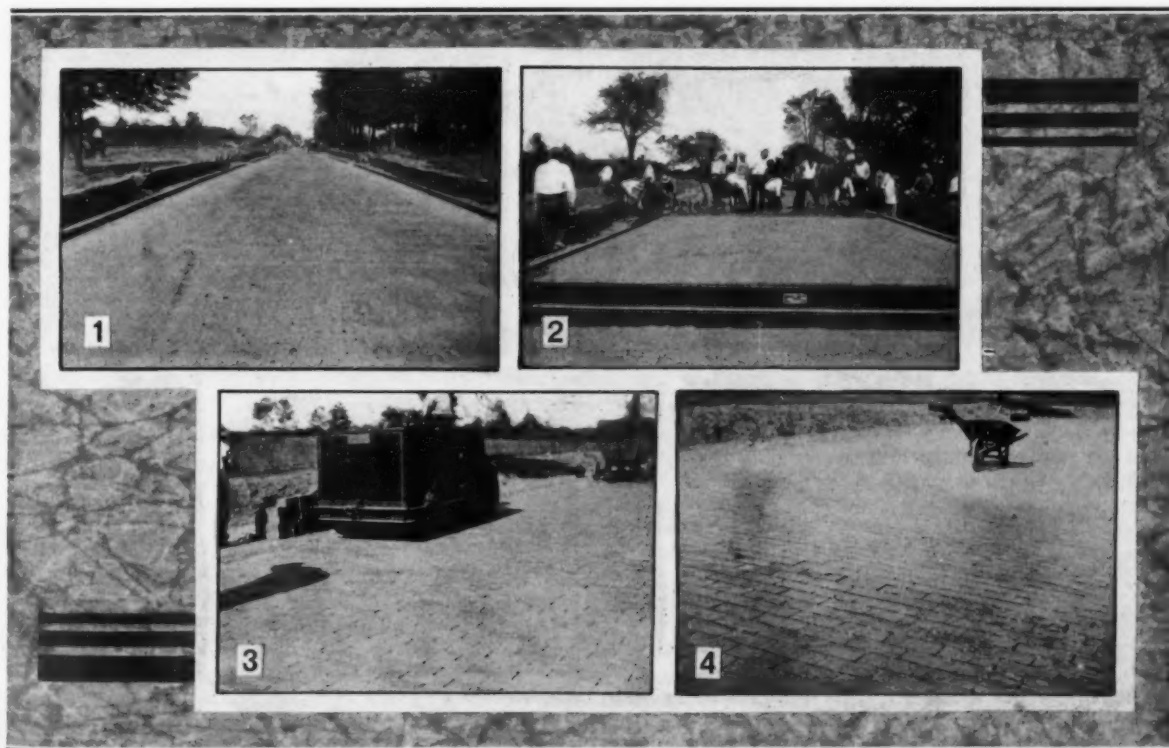
all times, and the asphalt was applied with mechanical squeegee buggies.

After the joints were completely filled a thin cover of sand was applied. This sand was the same for cushion and covering, and cost \$1.35 per cubic yard. For each square yard of pavement  $\frac{3}{4}$  cubic foot of sand was used. After the sand had been applied the pavement was again rolled with a 3-ton tandem roller to insure smoothness in place.

#### EXPERIMENTING TO PREVENT EXCESS ASPHALT ON SURFACE

When the filler was started it was found that after the first passage of the squeegee buggy the joints were not properly filled. Hand squeegee and buckets were used to complete the filler, but after this operation an excess of asphalt remained on the top of the bricks. This condition not being satisfactory, some experimenting was done, and it was found that passing over the brick twice with the squeegee buggies gave fine results. It was necessary that long enough time elapse between the first and second application to allow the first to pass the sticky stage. The joints are now well filled without an excess on the surface. About  $\frac{3}{4}$  gallon of asphalt per square yard of pavement was applied.

Using the methods and organization described above the contractors finished on November 1, at a total cost of approximately \$280,000, opening the last of three main arteries into Niagara Falls from all the eastern and central portions of the County.



PROGRESS PHOTOGRAPHS OF THE HIGHWAY FROM BASE TO ASPHALT FILLER

1. The completed concrete base, and brick stacked along the shoulders before laying. Note the smoothness of the base. 2. The sand screed finished sand cushion and brick dropping operations. 3. The brick in place and being rolled before the application of the asphalt filler. 4. Stages of asphalt application. The foreground shows the first application of the asphalt filler, and in the background is seen the second application and the sand covering

# How the Other Fellow Did It

## Construction Briefs

### Oiling Forms on a Concrete Road Job

**67.** It is customary to see a man carrying a heavy pail of fuel oil along the forms as he laboriously brushes the oil onto the steel forms to prevent the concrete sticking. A Tennessee contractor uses an insecticide sprayer of about two gallons capacity which is pumped up about every 50 feet to get pressure and then the man is able to walk rapidly and spray the forms with a thin film of oil, saving considerable time and quite a lot of oil over the old method of swabbing it on with a brush.

Another Tennessee contractor used the familiar knapsack type of insecticide sprayer which straps to the man's back and which has to be pumped continuously. This is perhaps not quite as convenient as the smaller one as it must be lifted to the man's back and securely strapped each time he is to use it, while the other device can be set aside and the man used for other work on the longer periods when he is not required for oiling forms. 19.3.93

### ¾-Yard Power Scraper Digs Core Trench for Dam

**68.** In the construction of the Furman Shoals Dam on the Oconee River, the contractors faced the problem of economically handling the excavation for the concrete core wall without disturbing adjacent soil at the tie-in at the end. The west wing of the dam, approximately 1,200 feet long, lies over relatively low ground, except at the outer end where it ties into a hill. For the low open section a considerable area was stripped to bedrock so that the rolled clay fill on the upstream side of the core wall might start from the bottom, but to avoid the excessive amount of excavating in the hill at the end which this procedure would have required, it was decided to excavate only enough for the extension of the core wall, well into the hill, leaving the structure tied into undisturbed soil—that is, to excavate in the hill only a trench just wide enough for the concrete core wall.

The trench needed was about 400 feet long, 5 feet wide at one end and 12 feet at the other, with an average depth between 40 and 45 feet. A ¾-yard power scraper was rigged to handle this work. The builders dug a shaft 12 feet square, at one end of the transition section which was 50 feet long and about midway of the whole trench, providing a place for the scraper to discharge the spoil and cutting the operating span in two, as the scraper first dug out the section east of the shaft. When this was completed it was shifted to the other side of the shaft. On each set-up the scraper operated between a tail block at the end of the trench and a set of guide blocks supported by the timbering of the shaft. The excavation was followed down by sheathing in 5-foot vertical sections. The scraper, whose width for the greater part of the excavation was only 4 or 5 inches narrower than the trench, cut almost vertical walls, saving considerable expense. SN-10.30

### Contractor Carries Two Paver Operators

**69.** One Southern contractor feels that it is real economy to carry two experienced paver operators on the payroll as insurance against illness. He has found that the second man is worth while as a general handy man on mechanical troubles all over the job and thus he has paid his way. In case of illness or accident to the No. 1 paver operator, the second man is all ready to jump in and prevent the job's being slowed up by an inferior or inexperienced operator. 19.3.60

### Wheeled Scrapers, Bucket Excavators and Power Grader Supplant Power Shovel on Salvage Job

**70.** On a Southern Michigan highway project the contractor felt that the grading was not of sufficient quantity nor depth to call for the use of a power shovel, so it was handled expeditiously with wheeled scrapers, a bucket excavator and a power grader. The bucket excavator was found to be particularly useful in this work as it cut the edges of the old macadam on the salvage job where they were too thin to use to advantage and loaded all the material direct to the truck to be hauled away from that point to fill elsewhere. Later, the excavator was taken to the borrow pit where material was loaded from the base of the pit for the shoulder on one end of the job and for the super-elevated and widened curves. 19.3.62

### Backing and Spilling at Batchers Eliminated

**71.** An Illinois contractor made use of two single batchers instead of a combined sand and stone batcher on a concrete job which permitted the trucks to drive through under the two batchers and eliminated the lost time of backing under a batcher and driving out. The trucks entered the batcher plant area from the main road, drove past the garage to the back of the plant where the stone stockpile and the stone batcher were located. It then turned and drove under the stone batcher, received its batch, then drove straight ahead to the sand batcher and from there to the cement car where the cement bags were thrown on. The time saved with this arrangement made possible eliminating several trucks from the hauling fleet. 19.2.75

### Home Made Roller Roughens Concrete Base for Asphaltic Concrete Binder Course

**72.** In pouring a widening strip averaging 10 feet in width on a Michigan sheet asphalt job with an asphaltic concrete binder course, and concrete widening strip, the contractor was faced with the problem of sufficiently roughening the slab which was 8 inches thick and not reinforced so that it would hold the binder course firmly and prevent creeping. To roughen the slab, it was rolled with a home-made roller made of a log about 5 feet long and 12 inches in diameter. This was set with studs of bolts and washers about 1½ inches in diameter projecting about the same amount. 19.3.63

### Stream of Water on Sheet Iron Ramp Speeds Washing of Sand

**73.** On an Ontario concrete road job, the contractor operated both his own quarry and sand pit. In the sand pit, which was semi-circular in shape, a hoist operated a 1½-yard scraper through sheaves at a right angle, which was varied as the pit was extended until the scraper was operating behind the hoist. The full load of sand was delivered by the scraper onto a sheet iron ramp, and from there was washed down by a stream of water flowing continuously from a 2-inch pipe and thus delivered well wet down to the sand washer. By the use of this stream of water it was unnecessary to have a laborer at the ramp to keep the sand moving as it was delivered by the scraper. 19.2.84



# State Highway Expenditures 1930 and 1931



*St. Louis Arena—Scene of the 1931 Road Show*

## Who's Who *among* Manufacturers *in the* Construction Field

Contractors and Engineers Monthly, 470 Fourth Ave., New York  
January, 1931

# State Highway Expenditures

## *An Analysis of Income from Various Sources Available for State Highway Construction and Maintenance in 1930 and 1931*

**F**ORTY-SIX of the forty-eight States co-operated with CONTRACTORS AND ENGINEERS MONTHLY in furnishing a summary of the expenditures in 1930 and of the probable expenditures for construction and maintenance in 1931. In cases where the fiscal year does not coincide with the calendar year, the States have furnished the information for the fiscal year which corresponds most closely with the calendar years of 1930 and 1931. No reports were received from Arizona and Oklahoma, and Tennessee was unable to furnish figures in time for publication. In the three cases where no reports were received, the estimated expenditures on State highways for 1931 prepared by the American Road Builders Association, and distributed early in December, were used.

Considering the three States which could not furnish reports, as making no change between their 1930 and 1931 expenditures, there were seven States which expect to spend the same amount of money in 1931 as in 1930. Twenty-four are increasing their expenditures and seventeen are spending less in 1931 than in 1930.

Inasmuch as most highway expenditures today are predicated upon gas tax income, it is interesting to note how this source has increased in most cases. Of the thirty-eight States which furnished data on this subject, three, Illinois, Massachusetts and New York, report that there can be no comparison between the income in 1929 and 1930 because the gas tax was only effective during the earlier part of the year. North Dakota reports that the total income from the gas tax increased 12 per cent in 1930 over 1929, but because of the large increasing refunds in the latter year, to farmers who use the gas for tractors, the Highway Department was actually experiencing a decrease of 11 per cent in income from this source. Of the remaining thirty-five States, thirty-three report an increase in gas tax revenue and two a decrease. Florida reports a 40 per cent decrease in 1930 over 1929, while Texas reports a 75 per cent increase. Between these two, the median appears to be around 10 per cent increase, showing that the users of highways are generally paying an increasing sum for the construction of improved hard surface roads.

The nominal increase of \$2,000,000 in expenditures will be considerably enhanced when legislatures meet this month. This will bring the expenditures for State highway construction and maintenance in 1931 close to one billion dollars.

### **Alabama**

There is available at present for Alabama highway construction and maintenance about \$3,500,000 for new work and approximately \$5,000,000 for work under construction. Any

further construction will have to be provided for by the next Legislature which convenes January 13.

*Woolsey Fennell, Highway Director and Chief Engineer  
State Highway Department  
Montgomery, Ala.*

### **Arizona**

No report was received but according to a statement of estimated expenditures on State highways for 1931 compiled by the American Road Builders Association, there will be \$6,500,000 available.

### **Arkansas**

For 1930 the Arkansas State Highway Commission had \$15,000,000 available from bond issues and a similar sum for 1931. The gas tax in Arkansas is 5 cents per gallon, the income from which is expended 20 per cent for State highway maintenance, 26 per cent is returned to the counties for local roads, and the remaining 54 per cent is applied to bond and interest payments on State and road district bond issues. The income from the gas tax showed an increase of 3 per cent in 1930 over 1929. Eighty per cent of the State highway construction is done by contract and all maintenance is done by State forces.

*T. A. Kleiber, Auditor  
State Highway Commission  
Little Rock, Ark.*

### **California**

In 1930, \$22,986,827 was available for State highway construction and maintenance in California from the gas tax; \$4,179,831 from Federal Aid; \$3,861,340 from motor vehicle licenses, and \$495,383 from the franchise tax on motor stage lines. The funds available for 1931 State highway maintenance and construction will be slightly larger than those for 1930, including \$22,940,000 from the gas tax; \$4,181,212 Federal Aid; \$3,457,000 from the motor vehicle license fees, and \$475,000 from the franchise vehicle stage lines. The gas tax in California is 3 cents per gallon.

The tax money is about equally divided between State highway construction, State highway maintenance and reconstruction and money returned to the counties for local road construction. The return from the gas tax has shown an increase of about 5.2 per cent in 1930 over 1929. About 95 per cent of the State highway construction of California is done by contract and about 5 per cent of highway maintenance is handled by contract, the remainder by the State.

*L. V. Campbell, Office Engineer  
Department of Public Works  
Sacramento, Calif.*

### **Colorado**

The funds which were available in 1930 for State highway maintenance and construction in Colorado totalled \$6,202,202: including \$4,086,000, which is 70 per cent of the 4-cent gasoline tax; \$1,796,202, Federal Aid; \$60,000, public utilities bus tax; \$60,000, internal improvement fund; \$25,000, county participation, and a balance of \$175,000 from the 1929 funds. The receipts which will be applied to highway construction in 1931 are practically the same as in 1930, except that the gas tax will be increased about \$300,000 and Federal Aid will be increased about the same amount. There was no balance left

over from 1930 funds. Expenditures of the State highway department were approximately 58 per cent for Federal Aid projects, 3 per cent for Federal Aid graveling, 9 per cent for State projects, 24 per cent for maintenance, and 3 per cent for surveys, signs and traffic census, new property and equipment, compensation insurance, and contingent funds and 3 per cent for administration.

About 98 per cent of the State highway construction is done by contracts and none of the maintenance is handled by contracts. All receipts available for use by the State Highway Department come in one common fund and the total of this fund is available for all expenditures of the department. Receipts from the 4-cent gasoline tax are divided as follows: 70 per cent to the State Highway Department, 27 per cent to the counties for local use and 3 per cent for use by the Highway Department for improvements in connecting links in cities and towns. In addition to these receipts about \$800,000 comes into the State Highway Department, composed of 50 per cent of the net proceeds from motor vehicle license fees. At the present time, however, all of the State Highway Department's proceeds from the motor vehicle license fees is being used to retire a 1923 bond issue. This will be fully paid within the next two years and then the department will have the use of this item.

O. T. Reedy, Senior Assistant Highway Engineer  
State Highway Department  
Denver, Colo.

### Connecticut

Sums available for State highway maintenance and construction in Connecticut for the fiscal year July 1, 1929, to June 30, 1930, were approximately \$4,344,000 from the gas tax, and \$8,478,000 from motor vehicle registration fines, fees, etc. For the fiscal year from July 1, 1930, to June 31, 1931, the estimated total available from gas tax collections will be \$4,200,000, and from motor vehicle registration, fines, fees, etc., \$8,360,000. The gas tax is 2 cents per gallon.

Approximately 75 per cent of the gas tax is used for State highway construction and 25 per cent for State highway maintenance. The gas tax money available for the current fiscal year has shown an increase of about 10 per cent over the previous year. All of the State highway construction in Connecticut is done by contract and about 4 per cent of the highway maintenance is done by contract.

O. L. Dorman, Statistician  
12 Washington St.  
Hartford, Conn.

### Delaware

The funds available for 1930 State highway maintenance and construction in Delaware were: \$1,009,500 from the gas tax; \$1,062,000 from the motor vehicle tax; and \$608,000 from Federal Aid funds. The funds available for 1931 are estimated at \$1,100,000 from the gas tax, \$1,070,000 from the motor vehicle tax and \$608,000 from Federal Aid funds. The income from the gas tax has shown an increase of about 15 per cent in 1930 over 1929. All of the State highway construction is done by contract and about 4 per cent of the

State highway maintenance is done by contract.

W. W. Mack, Chief Engineer  
State Highway Department  
Dover, Delaware

### Florida

The funds available for 1930 State highway maintenance and construction were: \$4,500,000 from the gas tax; \$3,550,000 from automobile registration; and \$1,250,000 from Federal Aid funds. The funds for 1931 construction and maintenance are about the same as those for 1930. The gas tax in Florida is 6 cents per gallon which is divided 2 cents per gallon for State highway construction and maintenance, 1 cent per gallon to be returned to the counties for roads, 2 cents per gallon returned to the counties to retire bonds and one cent per gallon applied to the maintenance of schools. The income from the gas tax showed a distinct loss between 1929 and 1930, the 1929 gas tax income being \$5,144,000 and for 1930, \$3,807,000.

About 85 per cent of the State highway construction is done by contract and none of the State highway maintenance is handled by contract, it all being done by State highway forces.

F. W. Berry, Jr., Office Engineer  
State Road Department  
Tallahassee, Fla.

### Georgia

The funds available for State highway maintenance and construction in Georgia for 1930 were \$9,000,000 from the 6-cent gas tax, and \$4,300,000 from licenses. The funds for 1931 construction and maintenance are \$9,500,000 from the gas tax, \$4,500,000 from licenses and \$5,000,000 Federal Aid.

Only 4 cents of the 6-cent gas tax is available for the use of the highway department as one cent per gallon is returned to the counties for local road work, and one cent is given to the schools. The gas tax showed an increase of about 2 per cent in 1930 over 1929. State highway construction is done approximately 85 per cent by contract and maintenance is handled 100 per cent by the State highway forces.

F. P. Vanotory, Treasurer  
State Highway Board of Georgia  
East Point, Ga.

### Total Highway Expenditures by States

	1930	1931
Alabama	\$15,000,000	\$8,500,000
Arizona	6,500,000	6,500,000
Arkansas	15,000,000	15,000,000
California	31,523,381	31,033,212
Colorado	6,202,202	6,802,202
Connecticut	19,022,000	12,560,000
Delaware	2,679,500	2,778,000
Florida	9,300,000	9,300,000
Georgia	13,300,000	19,000,000
Idaho	4,830,000	4,140,000
Illinois	52,819,000	43,550,000
Indiana	8,091,714	10,000,000
Iowa	48,374,000	31,128,000
Kansas	17,135,132	18,400,000
Kentucky	43,338,000	30,463,000
Louisiana	32,700,000	45,000,000
Maine	11,364,038	12,824,000
Maryland	11,593,036	11,639,730
Massachusetts	20,194,768	10,000,000
Michigan	48,508,301	48,508,301
Minnesota	25,100,000	23,350,000
Mississippi	2,632,000	7,700,000
Missouri	42,204,600	44,954,000
Montana	5,515,000	7,000,000
Nebraska	10,300,000	10,700,000
Nevada	1,088,000	3,137,808
New Hampshire	6,184,375	5,809,375
New Jersey	38,544,804	41,083,935
New Mexico	7,765,000	7,033,030
New York	60,000,000	55,000,000
North Carolina	22,907,551	22,585,937
North Dakota	2,135,483	2,155,293
Ohio	36,975,000	42,384,440
Oklahoma	16,000,000	16,000,000
Oregon	15,875,000	15,215,000
Pennsylvania	59,106,330	74,369,520
Rhode Island	4,006,000	4,300,000
South Carolina	12,600,000	20,000,000
South Dakota	6,400,000	6,400,000
Tennessee	12,000,000	25,000,000
Texas	33,700,000	35,100,000
Utah	4,181,719	4,382,000
Vermont	5,075,492	5,075,492
Virginia	15,568,873	15,400,000
Washington	15,613,231	12,940,922
West Virginia	23,885,442	21,274,680
Wisconsin	26,261,851	26,900,000
Wyoming	3,200,000	5,150,000
Totals	\$935,358,873	\$937,657,937

### Idaho

The State highway funds available in Idaho for 1930 were: \$2,800,000 from the gas tax; \$1,000,000 from the sale of five-year treasury notes predicated on the gas tax; and \$180,000, which is 9.7 per cent of the motor vehicle license income. In addition to this, \$850,000 was received from counties and highway districts. For 1931, there is available \$3,025,000 from the gas tax, \$180,000 from motor vehicle licenses, and \$935,000 from counties and highway districts. The gas tax in Idaho is 5 cents per gallon.

The income from the gas tax is divided between construction and maintenance at the discretion of the Commissioner of Public Works, although a small part of it is devoted to notes and interest on the bonds of the department. There was an increase of 5.98 per cent in the number of gallons of gasoline



sold in Idaho in 1930 over 1929 and a one-cent increase in the gasoline tax. A total of 90 per cent of the State highway construction is done by contract and about one-half per cent of the maintenance is done by contract. The State expects to take up about \$1,550,000 of Federal Aid money in 1931 to promote considerable additional construction.

*C. F. Potter, Chief Accountant  
Department of Public Works  
Boise, Idaho*

### Illinois

The funds available for 1930 State highway maintenance and construction in Illinois consisted of: \$27,375,000 from the gas tax; \$3,144,000 from bond issues; \$10,000,000 from motor license fees, from which \$8,000,000 was deducted for interest payments and principal retirements on outstanding highway bonds; \$4,000,000 from Federal Aid funds; and \$300,000 from miscellaneous collections. The funds available for 1931 maintenance and construction consist of: \$18,000,000 from the gas tax; \$2,000,000 from bond issues; \$10,250,000 from motor license fees, from which \$8,000,000 will be deducted for interest payment as in the previous year; \$5,000,000 from Federal Aid; and \$300,000 from miscellaneous collections. The gas tax in Illinois is 3 cents per gallon.

Of the gas tax money received, 66.7 per cent is used for State highway construction and 33.3 per cent is returned to the counties for local road construction. The present gas tax law did not become effective in Illinois until August 1, 1929, so that it is difficult to make comparisons between the 1929 and 1930 collections. About 95 per cent of the State highway construction is done by contract and none of its maintenance work is handled by contract.

*F. T. Sheets, Chief Highway Engineer  
Division of Highways  
Springfield, Ill.*

### Indiana

The funds available for 1930 State highway maintenance and construction in Indiana were: \$2,072,531 Federal Aid money and \$6,019,183 from license fees. For 1931 the money available is approximately \$4,000,000 from Federal Aid, and \$6,000,000 from license fees. An additional \$2,000,000 Federal Aid was appropriated by recent emergency legislation. Indiana has a gasoline tax of 4 cents per gallon, 75 per cent of which is devoted to State highway construction and maintenance and 25 per cent is returned to the counties for local roads. All of the State highway construction is done by contract and none of the maintenance work is done by contract.

*Don R. Leavitt, Superintendent of Statistics  
Indiana State Highway Commission  
Indianapolis, Ind.*

### Iowa

For 1930 the State Highway Commission of Iowa had available for maintenance and construction: \$6,388,000 from the gas tax; \$26,611,000 from bond issues; \$3,875,000 from Federal Aid; and \$11,500,000 from motor license fees. For 1931, the sums for maintenance and construction are: \$6,388,000 from the 3-cent gas tax; \$9,900,000 from bond issues; \$3,340,000 of Federal Aid money; and \$11,500,000 from motor license fees.

Approximately five-ninths of the tax money is used for State highway construction and maintenance, four-ninths being returned to the counties for local road construction. The gas tax showed an increase of 16 per cent in 1930 over 1929. All State highway construction and maintenance is done by contract. There is some possibility that funds available from bond issues may be augmented by further county bond authorizations early in 1931. The total possibilities of such increase are limited, however, and probably would not exceed \$3,000,000 at the outside.

*F. R. White, Chief Engineer  
Iowa State Highway Commission  
Ames, Iowa*

### Kansas

The funds available in Kansas for 1930 State highway maintenance and construction comprised: \$8,804,956 from the gas tax; \$2,330,176, Federal Aid; and \$6,000,000 from the auto license tax. The funds for 1931 consist of \$8,900,000 from the gas tax, \$3,500,000 Federal Aid and \$6,000,000 from the auto license tax. The gas tax in Kansas is 3 cents per gallon.

The tax monies used were 44 per cent for State highway construction, 20 per cent for State highway maintenance, 21 per cent returned to the counties for local road construction, and 6 per cent representing \$1,000,000 for gravel replacement, 3 per cent for administration and 6 per cent payment to district property owners. The item of \$1,000,000 expended for county liabilities and benefit district property owners will decrease each year as the county liability will finally be paid off. This liability is the amount of money owed by the counties on April 1, 1929, when the State highway system was taken over by the State Highway Commission under the present highway laws. The item of benefit district property owners will remain approximately the same for the next ten years.

The gas tax showed an increase of income in 1930 over 1929 because the rate was increased from 2 to 3 cents per gallon. Approximately 99 per cent of the State highway construction is done by contract with the State handling all of the maintenance work with its own forces.

*H. R. Goodyear, Auditor  
Kansas State Highway Department  
Topeka, Kansas*

### Kentucky

The revenues for the State Highway Commission are made available by two-year periods beginning April 1 of each even year. The following paragraphs show the estimated revenues for the biennial period beginning April 1, 1930, and ending April 1, 1932.

The State Highway Commission had the following money carried over from the previous period: cash, \$2,048,000; county donations in outstanding contracts, \$750,000; Federal Aid due on outstanding contracts, \$550,000; flood relief due on outstanding contracts, \$147,000; Federal Aid not allocated, \$442,000; miscellaneous, \$69,000. The money available from current revenues of the 5-cent gasoline tax was \$16,640,000; motor license tax, \$5,900,000; truck tax, \$1,100,000; bus tax, \$225,000; Federal Aid, 1931 and 1932 appropriations, \$4,713,000; flood relief, \$200,000; county donations, \$1,500,000; ad valorem tax, \$440,000; miscellaneous current revenues, \$60,000. Other revenues include toll collections from three bridges amounting to \$254,000 and reimbursements of \$300,000, from the toll bridge bond fund, making a total of \$35,338,000. In addition to this there are the net proceeds from the sale of bonds, after deducting reimbursements to the road fund which amounted to a total of \$8,000,000, which gives a grand total of all revenues of \$43,338,000.

The expenditures between April 1, 1930, and December 1, 1930, were: construction, \$8,297,000; maintenance, \$2,596,000; equipment, \$771,000; administration, \$230,000; engineering, which includes construction, location, laboratory, bridge department and road drafting, \$611,000; road warrants retired, \$134,000; toll bridge expenditures, \$167,000; other expenditures, \$69,000, making a total of \$12,875,000.

The program for the remainder of the biennial period from December 1, 1930, to April 1, 1932, includes: for construction, \$13,393,000, \$8,800,000 of which is for the completion of work now under way; maintenance, \$5,500,000; equipment, \$800,000; toll bridges, \$1,300,000; administration, \$500,000; engineering, \$770,000; interest on warrants, \$100,000; other expenditures, \$100,000, giving a total of \$22,463,000, which plus the toll bridge program of \$8,000,000 makes a grand total of \$30,463,000.

*H. D. Palmore, Chief Engineer  
State Highway Department  
Frankfort, Ky.*

### Louisiana

The funds which were available for 1930 State highway maintenance and construction in Louisiana amounted to \$6,000,000 from the gas tax, \$21,000,000 from bond issues, \$4,000,000 from license taxes, and \$1,700,000 from Federal Aid. The funds to be expended in 1931 for maintenance and construction include \$4,000,000 from the 1930 gas tax, \$35,000,000 from bond issues, \$4,000,000 from license taxes and \$2,000,000 Federal Aid. The gas tax in Louisiana is 5 cents per gallon.

All of the State Highway funds, with the exception of \$4,000,000 for maintenance, are expended on construction. The gas tax showed an increase of 2 per cent income in 1930 over 1929. In Louisiana 90 per cent of the State highway construction is by contract and all maintenance is by the State.

*Henry B. Henderlite, Chief Engineer  
Louisiana Highway Commission  
Baton Rouge, La.*

### Maine

The funds available for 1930 for State highway maintenance and construction in Maine consisted of: \$4,104,009 from the gas tax; \$2,000,000 from bond issues; \$884,913 Federal Aid; \$1,760,000, automobiles fees; \$1,033,685 appropriation and \$1,581,461 municipal funds. The monies available for 1931 include: \$4,250,000 from the gas tax; \$3,000,000 from bond issues; \$1,250,000 Federal Aid; \$1,463,500 from automobile fees; \$1,045,500 appropriation and \$1,815,000 municipal funds.

The gas tax in Maine is 4 cents per gallon. Approximately 50 per cent of the gas tax monies available are used for highway construction including State Aid and third class highway construction and 50 per cent for maintenance. These are the percentages of the gasoline tax after deducting \$300,000 for snow removal, the cost of collection and rebates. Of the 50 per cent used for highway construction, 37½ per cent is for State Aid road construction and 12½ per cent for third class highway construction. None of the gasoline tax is used for primary State highway construction. None of the gasoline tax is returned to towns or counties for other purposes.

The income from the gasoline tax showed an increase of approximately 10 per cent in 1930 over 1929. Approximately 80 per cent of the State highway construction and 2 per cent of State Aid highway and third class highway construction are done by contract. All of the maintenance work is done by State Highway Commission forces.

*Lucius D. Barrows, Chief Engineer  
State Highway Commission  
Augusta, Maine*

### Maryland

Maryland reports 1930 expenditures as: \$5,723,604 from the gas tax; \$2,264,903 from bond issues; \$2,522,549 received from the Commissioner of Motor Vehicles and \$1,052,000 Federal Aid. For 1931 there are available \$6,439,055 from the gas tax; \$1,000,000 from bond issues; \$2,648,675 from the Commissioner of Motor Vehicles and \$1,730,000 Federal Aid.

The gas tax in Maryland is 4 cents per gallon, 2 cents of which is used for maintenance and reconstruction, ½ cent used for the elimination of grade crossings and 1½ cents for the construction of State highways. The income from the gas tax showed an increase of 15.6 per cent in 1930 over 1929. The State Roads Commission of Maryland contracts for all State highway construction, but all maintenance work is done by State employees.

*William A. Codd, Chief Auditor  
State Roads Commission of Maryland  
Baltimore, Md.*

### Massachusetts

Massachusetts had available for 1930 State highway maintenance and construction: \$10,504,737 from the gas tax; \$7,187,051 from motor vehicle fees and fines; \$1,150,067 from assessments and contributions; and \$1,352,913 Federal Aid. The funds for 1931 consist of \$8,500,000 from the gas tax; and \$1,500,000 from Federal Aid.

The gas tax in Massachusetts is 2 cents per gallon. No set proportion is maintained in Massachusetts between the funds

used for State highway construction and for maintenance, the ratio being variable as necessity requires. A true percentage increase from the gas tax between 1929 and 1930 cannot be stated as the gas tax was in effect for only 8 months of 1929, during which time \$7,531,189 was received while in 1930 a total of \$10,504,737 was received. One hundred per cent of State highway construction and reconstruction is done by contract in Massachusetts while the State Highway Department itself handles all maintenance work.

*A. W. Dean, Chief Engineer  
Department of Public Works  
State House, Boston, Mass.*

### Michigan

In 1930 Michigan had available for State highway construction and maintenance: \$22,040,920 from the State motor vehicle license tax; \$21,824,877 from the gasoline tax; \$132,484 from the motor bus privilege fees; \$471,513 from miscellaneous fees; \$679,710 county funds receivable; \$207,750 assessment district funds; \$711,997 miscellaneous funds receivable; \$2,302,905 Federal Aid; \$61,098, salvage of right of way, and \$165,046 cash discounts, totaling \$48,598,301. The funds available for 1931 are approximately the same with an increase of from 2 to 3 per cent in funds from the gas tax, and about the same increase from license fees. The Federal Aid will probably increase \$200,000 more or less, and the county funds receivable will probably decrease \$150,000 to \$200,000.

The gas tax in Michigan is 3 cents per gallon. Of the funds received an amount equal to one-half the motor vehicle tax is returned to the counties for their use in highway work. This amount is apportioned as follows: one-eighth is divided equally among the counties, and seven-eighths divided according to the motor vehicle taxes collected in each county. The gas tax showed an increase in income of 1½ per cent between 1929 and 1930, from reports received to the end of December. From 80 to 90 per cent of State highway construction is done by contract. No maintenance work is done by contract.

*T. B. Dimmick, Statistical Engineer  
Highway Department  
Lansing, Michigan*

### Minnesota

For its State maintenance and construction Minnesota had available: \$6,600,000 from the gas tax, after the county share had been deducted; \$11,000,000 from the motor vehicle tax; \$3,500,000 Federal Aid; and \$4,000,000 release from the sinking fund. For 1931 there will be available: \$6,600,000 from the gas tax after the county share has been deducted; \$11,000,000 from the motor vehicle tax, and \$3,500,000 Federal Aid plus \$2,250,000 emergency fund.

The gas tax in Minnesota is 3 cents per gallon. The money available for State highway work exclusive of Federal Aid was used 66.7 per cent for State highway construction and 25.6 per cent for State highway maintenance and 7.7 per cent of the tax money was used for payment of interest on bonds. One-third of the gas tax was returned to the county.

The income from the gas tax showed an increase of 11.0 per cent in 1930 over 1929. All of the State highway construction is done by contract and about 30 per cent of the State highway maintenance is handled by contract.

*J. T. Ellison, Chief Engineer  
Department of Highways  
St. Paul, Minn.*

### Mississippi

In 1930 Mississippi had available for State highway maintenance and construction: \$2,083,000 for 9 months gas tax; \$207,000 from 9 months automobile tag fees and \$342,000 flood relief. For 1931 there will be available approximately \$3,500,000 from the gas tax, the major portion of which will be applied to maintenance and supervision; \$1,300,000 from county bond issues; \$1,300,000 Federal Aid; \$200,000 from the automobile tag fees and \$1,400,000 from the U. S. Emergency Relief Fund.

The gasoline tax in Mississippi is 5 cents per gallon. Up to November 1, 1930, the counties received 3 cents per gallon, but under the new law the 5-cent gas tax is divided  $2\frac{1}{2}$  cents each for the county and the State. Mississippi is one of the few states which showed a slight decrease in the income from the gas tax in 1930 under 1929. About 90 per cent of the State highway construction is done by contract and 15 per cent of the State highway maintenance work which includes hauling, surfacing and patching gravel roads.

*J. D. Monette, Office Engineer  
Mississippi State Highway Department  
Jackson, Miss.*

### Missouri

For use in 1930 the State Highway Department received for maintenance and construction: \$8,548,600 from the gas tax; \$20,000,000 from bond issues; \$10,056,000 from motor vehicle license fees; \$3,000,000 from Federal Aid and \$600,000 corporation filing fees. For 1931 it is estimated that there will be available: \$8,977,000 from the gas tax; \$25,000,000 from the bond issues; \$10,377,000 from motor vehicle license fees, and \$600,000 from corporation filing fees and miscellaneous sources.

The gas tax in Missouri is 2 cents per gallon. The tax money is expended about 59 per cent for State highway construction and 41 per cent for State highway maintenance. These figures are the percentages which would take care of construction and annual maintenance but what really happens is that all of the revenues go into a common fund to cover the various expenditures of the department. The identity of the gas tax dollar is lost, and it is difficult to tell exactly what portion goes to any special purpose. Income from the gas tax; \$2,500,000 Federal Aid and \$1,500,000 from gasoline tax anticipation warrants, if authorized by the Legislature.

*T. H. Cutler, Chief Engineer  
Missouri State Highway Department  
Jefferson, Mo.*

### Montana

For 1930 the State Highway Commission of Montana had available for construction and maintenance approximately \$3,000,000 from the gas tax; \$1,515,000 from the regular Federal Aid appropriation and \$1,000,000 additional Federal Aid. For 1931 there is available for State highway maintenance and construction, depending partly on the action of the Legislature which meets in January, approximately \$3,000,000 from the gas tax; \$2,500,000 Federal Aid and \$1,500,000 from the sale of gasoline tax anticipation warrants, if authorized by the Legislature.

The gas tax in Montana is 5 cents per gallon. The State Highway Commission receives "net" collections, after refunds are paid which amount to about 75 per cent of the gross. The net gas tax is expended about 75 per cent for State highway construction, 20 per cent for State highway maintenance and about 5 per cent for administration and miscellaneous accounts. All State highway construction is handled by contract and all maintenance is handled by the forces of the State Highway Commission.

*R. D. Rader, State Highway Engineer  
State Highway Commission  
Helena, Montana*

### Nebraska

The approximate income for State highway maintenance and construction for 1930 in Nebraska was: \$6,600,000 from the gas tax; \$100,000 from the property tax; \$1,100,000 from motor vehicle registration fees, and \$2,500,000 from Federal Aid. For 1931, the State Department of Public Works anticipates having available: \$6,930,000 from the gas tax; \$100,000 from the property tax; \$1,200,000 motor vehicle registration fees; and \$2,500,000 Federal Aid.

The gas tax in Nebraska is 4 cents per gallon. Approximately 48 per cent of the tax money is used for State highway construction, 27 per cent for State highway maintenance and 25 per cent is returned to the counties for local road work.

The gas tax showed an increase of 5 per cent in income in 1930 over 1929. Approximately 95 per cent of the State highway construction in Nebraska is done by contract and all of the highway maintenance is done by the Department.

*E. J. Babcock, Jr., Assistant Office Engineer  
Department of Public Works  
Lincoln, Nebraska*

### Nevada

The State Department of Highways of Nevada had available for 1930 State highway maintenance and construction: \$650,000 from the gas tax; \$150,000 from bond issues; \$140,000 from motor vehicle licenses; \$106,000 from a State tax levy and \$40,000 from common carrier licenses. For 1931, there are available: \$650,000 from the gas tax; \$140,000 from motor vehicle licenses; \$106,000 from the State tax levy, and \$50,000 from common carrier licenses; approximately \$1,600,000 Federal Aid and under the Colton-Oddie bill, Nevada will receive an additional \$591,898. The revenue derived under the present system of State taxation for highway work is just sufficient to meet Federal Aid and to take care of maintenance.

The gas tax in Nevada is 4 cents per gallon. This tax is used approximately 50 per cent for State highway construction and 50 per cent for highway maintenance. The gas tax showed an increase of 10 per cent in income in 1930 over 1929. Approximately 95 per cent of State highway construction in Nevada is done by contract while all of the State highway maintenance is done by the department employees.

*H. D. Mills, Office Engineer  
Department of Highways  
Carson City, Nev.*

### New Hampshire

The State Highway Commission of New Hampshire had available for State highway maintenance and construction in 1930: \$2,100,000 from registration fees; \$1,675,000 from the gas tax; \$1,500,000 from bond issues; \$609,375 from Federal Aid; and \$300,000 from miscellaneous sources. The funds available for 1931 construction and maintenance includes the estimated gas tax income of \$1,900,000; \$1,000,000 from bond issues; \$2,100,000 from registration fees; \$609,375 Federal Aid, and \$200,000 from miscellaneous sources.

The gas tax in New Hampshire is 4 cents per gallon, 3 cents of which goes to the State Highway Department and one cent to retire bonds. All income of the department is maintained as a general fund and used as needed for all kinds of work. The gas tax showed an increase of 12 per cent in 1930 over 1929. All of the State highway construction is done by contract and practically all maintenance is done by State forces.

*J. H. Johnson, Assistant Commissioner  
Patriot Bldg.  
Concord, N. H.*

### New Jersey

The State of New Jersey had available for State highway maintenance and construction in 1930: \$10,979,439 as a balance available from the previous year; \$11,000,000 from the gas tax; \$8,400,000 allotted from the motor vehicle fees for construction; \$4,465,365 from the mill property tax, after the sinking payment and interest on the bond issue had been deducted; \$2,200,000 return from the Bridge and Tunnel Commission of money advanced in previous years; and \$1,500,000 Federal Aid. It is estimated that funds available for 1931 will be: \$850,000 balance from 1930; \$12,360,000 from the gas tax, with a special appropriation to municipalities and interest on the bond issue deducted; \$18,000,000 from bond issues; \$7,138,935 motor vehicle fee allotment for construction and maintenance; \$128,000 from one-mill property tax, with sinking fund and interest on bond issue deducted; \$1,500,000 Federal Aid and \$1,107,000, from the Federal Government.

The gas tax in New Jersey for 1929 and 1930 was 2 cents per gallon. At the November election it was increased to 3 cents per gallon, the increase taking effect December 1, 1930. The sinking fund and interest requirements of the \$100,000,000



fund issue authorized by referendum vote in November, are met from the gas tax. In addition there is deducted from this tax \$5,000,000 which is returned to municipalities on the basis of total ratables of the State. The remainder of the gas tax becomes available for construction of the State highway system. The gas tax showed an increase of 10 per cent in income in 1930 over 1929. Approximately 99 per cent of the State highway construction in New Jersey is done by contract and about 10 per cent of the State highway maintenance is done by contract.

*W. L. Howell, Chief Auditor and Accountant  
New Jersey State Highway Department  
Trenton, N. J.*

### New Mexico

The New Mexico State Highway Department had available in 1930 for State highway construction and maintenance: \$2,700,000 from the gas tax; \$2,600,000 from bond issues; \$465,000 from motor vehicle license fees and \$2,000,000 Federal Aid. For 1931, there are available approximately \$3,000,000 from the gas tax; \$500,000 from the motor vehicle license fees and \$2,000,000 Federal Aid.

The gas tax in New Mexico is 5 cents per gallon. The relationship between the amount of money used from the gas tax on construction and maintenance is not fixed. The gas tax collections in any one year are anticipated through the sale of debentures. The gas tax income increased 22 per cent in 1930 over 1929. All of the larger construction projects in the State are handled by contract, but all of the maintenance work is done by State Highway Department forces.

*New Mexico State Highway Department  
Santa Fe, N. M.*

### New York

The total expenditures for State highway construction and maintenance for 1931 will probably be about \$55,000,000.

*Arthur W. Brandt, Commissioner  
Division of Highways  
Department of Public Works  
Albany, N. Y.*

### North Carolina

The North Carolina State Highway Commission had available for State highway maintenance and construction for the fiscal year ending June, 1930; \$12,895,051 from gas tax; \$7,023,880 from automobile licenses and titles; \$2,871,122 Federal Aid; and \$117,498 sundry revenue. For the fiscal year ending June 30, 1931, the sums available are: \$12,617,082 from the gas tax; \$7,047,733 from automobile licenses and titles; \$2,871,122 Federal Aid; and \$50,000 sundry revenue. This money available is based on the current revenue from the gasoline tax and automobile licenses and titles. The Legislature meets in January and it is impossible to surmise what the action will be in regard to the issuance of additional bonds. If the action is favorable and a bond issue is approved, there will be additional funds available for construction during 1931 and 1932.

The gas tax in North Carolina is 5 cents per gallon. Approximately 17.2 per cent of the tax is used for State highway construction, 26.3 for State highway maintenance and betterments and 15.4 per cent is given to the counties for local roads, 1.1 per cent for administration, 37 per cent for paying interest on and for the retirement of bonds, 2.3 per cent for the expense of collecting taxes and 0.7 per cent for the admirable highway patrol maintained by the Highway Commission. The income from the gas tax showed a decrease of 1.87 per cent in 1930 over 1929. Approximately 95 per cent of State highway construction work in North Carolina is done by contract while all of the maintenance work is done by State highway forces.

*W. E. Hawkins, Construction Engineer  
State Highway Commission  
Raleigh, N. C.*

### North Dakota

The North Dakota State Highway Department had available for State highway maintenance and construction in 1930: \$1,260,000 from the gas tax; \$785,483 from motor vehicle fees; and \$90,000 from miscellaneous sources. For 1931,

there will be available \$1,260,000 from the gas tax; \$795,293 from motor vehicle fees and about \$100,000 from miscellaneous sources.

The gas tax in North Dakota is 3 cents per gallon. After deductions have been made from the gas tax through refunds for farm tractors, etc., which amount to 40 per cent of the total collections, about two-thirds of the money is used for State highway construction and maintenance and one-third is returned to the counties for local road work. A rather unusual condition existed in the relationship of the gas tax for 1929 and 1930, in that while the total income from the gas tax increased 12 per cent, there was an actual decrease of 11 per cent in the receipts to the Highway Department due to increased refunds. All State highway construction in North Dakota is done by contract and all maintenance by State highway forces.

*C. A. Myhre, Assistant Chief Engineer  
State Highway Department  
Bismarck, N. D.*

### Ohio

The Ohio State Highway Department had available for construction and maintenance of State highways in 1930, the sums of: \$22,000,000 from the gas tax; \$3,000,000 from railroads for grade separation; \$2,700,000 Federal Aid; \$2,000,000 from counties; \$7,100,000 from automobile tags and \$175,000 from motor bus fees. Estimated funds for 1931 are \$25,000,000 from the gas tax; \$3,000,000 from the railroads for grade separation; \$4,584,440 Federal Aid; \$2,500,000 from counties; \$7,100,000 from automobile license tags and \$200,000 from motor bus fees.

The gas tax in Ohio is 4 cents per gallon. The money from the gas tax is used 40 per cent for State highway construction, 22½ per cent for State highway maintenance; 12½ per cent for the maintenance of county roads; 2½ per cent for the construction of county roads; 17½ per cent to cities for maintenance and 5 per cent to townships for maintenance. Early in December, 1930, the income from the gas tax had shown an apparent increase of 2½ per cent over 1929, but conditions pointed to the fact that this increase might be wiped out before the end of the year. All State highway construction in Ohio is done by contract and about 30 per cent of the State highway maintenance is done by contract.

*Earl V. Murray, Statistician  
Ohio State Highway Department  
Columbus, Ohio*

### Oklahoma

No report was received from Oklahoma but according to a report from the American Road Builders Association, there will be approximately \$16,000,000 available for 1931 State road construction and maintenance.

### Oregon

The Oregon State Highway Commission had the following funds available for 1930 State highway maintenance and construction: \$6,200,000 from the gas tax; \$1,500,000 from bond issues; \$5,825,000 from license fees; \$1,600,000 Federal Aid; \$250,000 county cooperation and \$500,000 from other sources. For 1931 there will be available: \$6,800,000 from the gas tax; \$1,500,000 from bond issues; \$4,265,000 from license fees; \$2,000,000 Federal Aid; \$300,000 county cooperation and \$350,000 from other sources.

The gas tax in Oregon is 4 cents per gallon, all of which is used for State highway construction and maintenance; there is no segregation. The income from the gas tax showed an increase of 10 per cent in 1930 over 1929. About 95 per cent of the State highway construction is done by contract and 20 per cent of the State highway maintenance work is done by contract.

*S. H. Probert, Office Engineer  
Oregon State Highway Commission  
Salem, Oregon*

### Pennsylvania

The fiscal year of the State Department of Highways of Pennsylvania is from June 1, to May 31. For the fiscal year

June 1, 1929, to May 31, 1930, the funds available for State highway maintenance and construction included \$29,240,534 from the gas tax; \$29,853,796 from the motor vehicle registration, and \$12,000 from the general fund. For 1930-31 the funds available are \$25,250,000 from the gas tax; \$49,107,520 from the motor fund, and \$12,000 from the general fund.

The gas tax in Pennsylvania was reduced from 4 cents to 3 cents, effective July 1, 1930. All of this is used for State highway construction and maintenance with the exception of  $\frac{1}{2}$ -cent per gallon which is returned to the county for local road work. The income from the gas tax in Pennsylvania for the fiscal year 1929-30 increased 46.7 per cent over the fiscal year 1928-29. This was due principally to the increase from 3 cents to 4 cents gas tax, effective for one year. Approximately 95 per cent of the State highway construction is done by contract while all of the maintenance work is done by State forces.

*Samuel Eckels, Chief Engineer  
Department of Highways  
Harrisburg, Penna.*

### Rhode Island

The State Board of Public Roads of Rhode Island had the following funds available for State highway maintenance and construction in 1930: \$1,200,000 from the gas tax; \$146,000 for bridges from bond issues; \$2,000,000 from motor vehicle registration; \$60,000 from court fines, and \$600,000 Federal Aid. For 1931, there are available: \$1,070,000 from the gas tax; \$1,950,000 from motor vehicle registration; \$80,000 from court fines and \$1,200,000 Federal Aid.

The gas tax in Rhode Island is 2 cents per gallon. All of the gas tax money is used for State highway construction. The gas tax showed an increase of income of 17 per cent in 1930 over 1929. One hundred per cent of the State highway construction is done by contract and all of the State highway maintenance is done by State forces.

*G. H. Henderson, Chief Engineer  
State Board of Public Roads  
Providence, R. I.*

### South Carolina

No information was received from the State Highway Department of South Carolina regarding the amount of funds available or expenditures for State highway maintenance during 1930. However, the amount of expenditures for the construction of State highways during 1930 amounted to approximately \$12,600,000. The State highway construction program for 1931 will probably call for expenditures amounting to \$20,000,000.

The gas tax in South Carolina is 6 cents per gallon, of which the South Carolina State Highway Department receives 5 cents and the counties one cent for local roads.

*Chas. H. Moorefield, State Highway Engineer  
State Highway Department  
Columbia, S. C.*

### South Dakota

The funds available for State highway maintenance and construction in South Dakota for 1930 were: \$3,000,000 from the gas tax; \$1,600,000 from motor vehicle taxes, and \$1,800,000 from Federal Aid, making a total of \$6,400,000. The funds available for State highway maintenance and construction for 1931 will depend on the action of the 1931 Legislature since there is much agitation in regard to cutting the State program.

The gas tax in South Dakota is 4 cents per gallon. All of the gas tax money goes into the Highway Fund but each portion is kept separate: 45 per cent of the tax is used for State highway construction, 45 per cent is used for State highway maintenance with 5-cent overhead. The return from the gas tax showed an increase of 10 per cent in income in 1930 over 1929. About 97 per cent of the State highway construction is done by contract and about 25 per cent of the State highway maintenance is done by contract.

*H. E. Abell, Office Engineer  
State Highway Department  
Pierre, S. D.*

### Tennessee

No definite amount has been appropriated for Tennessee highway construction and maintenance. It is hoped that the Legislature will provide a program of approximately \$25,000,000 but as this is absolutely dependent upon legislative action, no advance statement can be made as to the 1931 program until after the Legislature has provided the funds to finance it.

*John L. Neely, Jr., Office Engineer  
Department of Highways and Public Works  
Nashville, Tenn.*

### Texas

In 1930 Texas had available for State highway construction and maintenance approximately \$22,000,000 from the gas tax; \$4,200,000 from auto registrations, and \$7,500,000 Federal Aid. There will be available in 1931 approximately \$23,000,000 from the gas tax; \$4,600,000 from auto registrations, and \$7,500,000 from Federal Aid. The amount of the gas tax in Texas is 4 cents per gallon. Counties contribute toward construction work but the exact amounts available for 1930 and 1931 are not known. There is no State road bond issue in Texas at this time.

Funds derived from these sources are not applied specifically to one type of expenditure. During the last fiscal year of the Department, construction expenditures amounted to 69.61 per cent of the total, while maintenance expenditures amounted to 25.69 per cent. Appropriations made by the Legislature out of the Highway Fund for general overhead and expenses for license plates and other registration supplies amounted to 1.56 per cent. Equipment purchases and other miscellaneous items, such as State motor patrol, amounted to 3.14 per cent. The percentage of expenditures varies for each year.

The calendar year 1930 will show about a one per cent loss in gallonage on gasoline tax collections, whereas the income to the State Highway Department from this source for the year 1930, over the year 1929, will reflect an increase of approximately 75 per cent. This is due to the fact that during more than half of the calendar year 1929 the gas tax was 2 cents per gallon, and during the latter part of that year, by Legislative Act, the rate was raised to 4 cents per gallon, which has been in effect during the entire year 1930.

One hundred per cent of the Texas highway construction is done by contract. Regular maintenance is carried on by the Department while betterment or extraordinary maintenance is done approximately 50 per cent by the Department and 50 per cent by contract.

*G. H. Lloyd, Chief Accountant  
State Highway Department  
Austin, Texas*

### Utah

The State of Utah had available in 1930 for State highway construction and maintenance: \$2,000,000 from the gas tax; \$1,421,719 Federal Aid; \$700,000 County Aid, and \$60,000 from the auto stage and truck line tax. Funds available for 1931 will be approximately: \$2,200,000 from the gas tax; \$1,417,000 Federal Aid; \$700,000 County Aid, and \$65,000 from the auto stage and truck line tax.

About 50 per cent of the gasoline tax, which is  $3\frac{1}{2}$  cents per gallon, goes for State highway construction and the other 50 per cent for highway maintenance. There is no distribution by law as to the use of gasoline tax funds as between State road construction and maintenance. The percentages given are as they work out in actual practice. The returns from the gas tax in 1930 over 1929 showed an increase of 10 per cent. About 86 per cent of the State highway construction is done by contract and no maintenance is done in this manner.

The factor of railroad cooperation in the costs of grade separation crossings will amount to \$40,000. Forest highway construction with forest funds will aggregate \$280,000 on roads which are a part of the State system but this is expended by the U. S. Bureau of Public Roads and consequently not a part of the State's accounting except insofar as State funds

may be advanced from the sources named to cooperate in this class of construction.

*Erna C. Knowlton, Assistant Engineer  
State Road Commission  
Salt Lake City, Utah*

### Vermont

Funds which were available in 1930 for State highway construction and maintenance in Vermont were: \$4,050,000 appropriation from gas tax and auto registration fees; \$150,000 State tax; \$611,000 Federal Aid, and \$264,483 excess receipts from the gas tax added to the highway fund on July 1, 1930. The annual appropriations amount to \$4,050,000 and there is a provision in the Act that if the receipts from the 4-cent gas tax plus the receipts from auto registrations amount to more than \$4,050,000, the excess shall be added to the highway funds. For the last fiscal year this excess was \$264,483 and indications are that the amount collected this year will be approximately the same. Returns from the gas tax in 1930 over 1929 showed an increase of 7 per cent. As the Vermont Legislature meets in January, it is impossible to state what funds will be available for 1931. It is probable that they will be approximately the same as those for 1930.

About half the gas tax funds is used for highway construction and the other half for maintenance work. The State Highway Department does all the maintenance while about 75 per cent of the State road construction is done by contract.

*W. L. Carpenter, Chief Clerk  
Vermont Department of Highways  
Montpelier, Vt.*

### Virginia

For the year July 1, 1930, to June 30, 1931, a total of \$15,568,873 is available for State highway construction and maintenance, this sum being made up as follows: equivalent to a one-mill tax, \$1,650,000; motor vehicle fuel tax, 3½ cents, \$7,500,000; convict labor, \$500,000; title fees, bus licenses, etc., \$400,000; Federal Aid, \$1,450,000; making a total of \$11,500,000 for construction and \$4,068,873 for maintenance. Funds for the year July 1, 1931, to June 30, 1932, will be approximately as follows: convict labor, \$586,695; motor vehicle fuel tax, \$6,234,420; registration fees and carrier taxes, \$423,530; Federal Aid, \$2,379,788; equivalent to one-mill tax, \$1,525,370, making a total, minus \$259,803 for surveys, maps and plans, giving \$10,900,000 net for construction, with approximately \$4,500,000 for maintenance. The gas tax in this State is 5 cents per gallon, of which 1½ cents goes to the counties. The return of the 1930 gas tax showed an increase of 10 per cent over 1929.

All State highway maintenance is done by the Department and about 60 per cent of the construction is done by contract.

*A. H. Pettigrew, Senior Assistant Engineer  
Virginia Department of Highways  
Richmond, Va.*

### Washington

Funds available for the State highway construction and maintenance in Washington for the fiscal year ending March 31, 1931, are as follows: from gas tax and motor vehicle license fees, \$14,686,200, and Federal Aid, \$1,927,031. The motor vehicle fund, from which appropriations are made by the Legislature for State highway work, consists of the receipts of a 2-cent gas tax and the motor vehicle license fees. From these receipts there is deducted a transfer to the permanent highway fund for county roads of approximately \$1,900,000. There is also deducted the cost of collecting motor vehicle license fees. The balance is subject to appropriation for State highway work, which for the fiscal year ending March 31, 1931, will amount to approximately \$14,686,200. Funds available for the fiscal year ending March 31, 1932, will be \$11,000,000 (plus any balance left over from the previous year) and \$1,940,922 Federal Aid.

The gas tax is 3 cents per gallon, 2 cents of which goes for State highway construction and maintenance and 1 cent goes to the counties for their road work. The gas tax returns for 1930 show an increase of 8 per cent over 1929. Practically

all construction work is done by contract while all maintenance work is done by State forces.

*Lawrence R. Turnbull, Office Engineer  
Washington Department of Highways  
Olympia, Wash.*

### West Virginia

The West Virginia State Road Commission received in 1930: \$5,031,318 from the 1929 gas tax; \$15,000,000 from bond issues; \$1,321,376 Federal Aid, and \$4,532,748 from 1929 motor vehicle licenses. None of the gasoline tax is used directly for road construction but is used partly to pay interest on State road bonds and partly for State road maintenance. The proceeds of the motor vehicle licenses are used to pay the sinking fund on State road bonds, overhead expenses of the State Road Commission and part of the costs of State road maintenance. They may be used also to pay interest on State roads bonds, and if there is a balance it may be used for construction. Virtually all construction costs to date have been paid from bond money and Federal Aid. Estimated funds for 1931 are \$5,300,000 from the 1930 gas tax; \$10,000,000 from bond issues; \$1,324,680 Federal Aid, and \$4,650,000 from 1930 motor vehicle licenses.

The gas tax is 4 cents per gallon, 45 per cent of which is used for state maintenance and the remainder for interest on state road bonds. The returns from gas tax in 1930 showed an increase of 5.3 per cent over 1929. No maintenance work is done by contract but about 95 per cent of all State highway construction is done by contract.

*A. J. Mills, Statistician  
State Road Commission  
1340 Wilson St., Charleston, W. Va.*

### Wisconsin

In 1930 funds available for State highway construction and maintenance were: \$8,012,481 from the gas tax; \$4,900,000 from county bonds and tax; \$11,267,790 from motor vehicle license fees; \$1,854,580 Federal Aid, and \$227,000, railroads and miscellaneous. Under the laws of this State, the total amounts received from gas tax and motor vehicle fees together with the Federal Aid allotments are considered as a highway fund from which the various appropriations and allotments to the counties are made. Funds which will be available for 1931 are: \$8,500,000 from the 1930-1931 gas tax; \$3,700,000 from county bonds and taxes; \$11,500,000 from motor vehicle license fees; \$3,000,000 Federal Aid, and \$200,000, railroads and miscellaneous.

The amount of the gas tax in this State is 2 cents. Of this tax 57 per cent goes for State highway construction, 20 per cent for maintenance, 22 per cent returned to the counties and local units for roads, and 1 per cent for miscellaneous highway activities. In computing the percentage of the net tax used for these various purposes, the percentages shown are those of that total fund as distributed for the fiscal year ending June 30, 1930. An increase of 15.6 per cent was shown in the returns for gas tax for 1930 over 1929. About 90 per cent of the State highway construction is done by contract while a very negligible amount of maintenance work is done in that manner.

*W. B. Blair, Chief Accountant  
Wisconsin Highway Commission  
Madison, Wis.*

### Wyoming

The State Highway Department had available in 1930 for State highway construction and maintenance the following: \$1,070,000 from the gas tax; \$1,000,000 Federal Aid; \$670,000 from auto licenses, and \$460,000 from oil royalties, totaling \$3,200,000. Funds available for 1931 will be: \$1,070,000 from the gas tax; \$1,000,000 from bond issue; \$2,100,000 Federal Aid; \$540,000 from auto licenses, and \$440,000 from oil royalties, totaling \$5,150,000.

About 75 per cent of the gas tax, which is 4 cents per gallon, goes for construction and the remaining 25 per cent for maintenance work. In 1930 the gas tax returns showed an increase of 5 per cent over 1929.

*Z. E. Severson, State Highway Superintendent  
State Highway Department  
Cheyenne, Wyo.*



# Who's Who in Construction

## *A Series of Reports from Active Contractors*

### BUS. VOLUME—ANNUAL VOLUME OF CONTRACTS

- A—Over \$5,000,000
- B—Between \$1,000,000 and \$5,000,000
- C—Between \$500,000 and \$1,000,000
- D—Between \$250,000 and \$500,000
- E—Under \$250,000

**Hagedorn Construction Co., Brookville, Penna.** Organized: 1920. Bus. vol. C. This company was first organized in Alabama in 1920, moved to Greensboro, N. C., in 1923, and then to Pennsylvania in 1927. Officers: H. Hagedorn, President and Treasurer; W. R. Ross, General Superintendent. Major contracts: 1926, Greensboro-High Point Blvd., N. C., \$450,000; water filtration plant, \$150,000, and sewage disposal plant, \$150,000, Winston Salem, N. C.; 1927, Northwestern Turnpike, Taylor and Preston Counties, West Va., \$275,000; 1928-30, construction in Pennsylvania, Cambria et al Counties, \$300,000; two contracts, Venango County, \$250,000; two contracts, Jefferson County, \$575,000; Erie County, \$210,000; Venango County, \$300,000.

**C. W. Blakeslee & Sons, Inc., New Haven, Conn.,** 58 Waverly St. Organized: January 1, 1929. Bus. vol. B. This business was founded in 1844 by Charles W. Blakeslee, who later formed a partnership with his three sons. The business was incorporated January 1, 1929. Officers: Clarence Blakeslee, President; Ray J. Reigeluth, M. Grant Blakeslee and William T. Gilbert, Vice Presidents; Dennis A. Blakeslee, Treasurer; Harold L. Blakeslee, Assistant Treasurer; Albert D. Blakeslee, Secretary; Lyman T. Law, Assistant Secretary. Major contracts: 1928, English Station foundations for United Illuminating Co.; 1925-30; North Branford Water Works Development for the New Haven Water Co.; 1929-30, Cornwall Bridge for State of Connecticut; sewage disposal plant for the City of New Haven; several miles of conduit for the Southern New England Telephone Co., United Illuminating Co., and the American Telephone & Telegraph Co.; several contracts for the New York, New Haven & Hartford R. R. Co.; 1930-31, 7-mile Foxon concrete road contract for Connecticut State Highway Department, asphalt street paving for the Cities of New Haven and Providence, R. I., and the State of Connecticut.

**Peter Kiewit's Sons, Omaha, Nebr.,** 911 Omaha National Bldg. Organized: 1914. Bus. vol. B. This company was established in 1884 by Peter Kiewit, who formed a partnership with his sons in 1912. Mr. Kiewit died in 1914 and in 1919 the business was incorporated under its present name. The firm is engaged in all building construction, public, railroad, office, warehouse, churches, etc., except residential. Officers: Ralph W. Kiewit, President and Treasurer; Peter Kiewit, Vice President and Secretary. Major contracts: 1928, Metropolitan Utility District Office Building, Omaha, \$300,000; St. Joseph's Hospital, Omaha, \$400,000; Union State Bank Building, Omaha, \$420,000; 1928-30, Nebraska State Capitol, Lincoln, Nebr., \$1,340,000; 1929, Barker Building, Omaha, \$450,000; Northwestern Bell Telephone Building, Omaha, \$300,000; 1929-30, Joslyn Art Memorial, Omaha, \$500,000; 1930, International Harvester Co., Warehouse Building, Grand Island, Nebr., \$250,000; U. P. Passenger Terminal, Omaha, \$1,000,000. Member: Omaha Builders Exchange; Nebraska Master Builders Assn.; A. G. C. of A.

**The West Construction Co., Chattanooga, Tenn.,** was organized as a West Virginia corporation, in 1902, for the purpose of street and road construction and operated continuously until about two years ago, at which time they retired temporarily from active work. L. B. West is President and owner of this company. There are now four construction companies commonly referred to as the "West" organizations, with L. B. West as the prime mover in each organization, although at the present time he is only active in an advisory capacity. The major operations of the West Construction Co., extended over the nine southeastern states in which the "West" companies are now operating, and the principal contracts were in the eastern sections of North Carolina for the State Highway Department, the contracts ranging up to the sum of approximately \$4,000,000.

**The Wesco Co.** was originally a branch of the West Construction Co., but in 1917 was incorporated under the laws of Tennessee as a separate corporation with M. N. Leventhal as President. L. B. West was originally Vice President but recently retired. This company operated principally in the States of Tennessee, Alabama and Georgia. The major contracts of the Wesco Co., during the last three years, were: for the State Highway Board of Georgia, in 1930, 30 miles of road work, approximately \$800,000; City of Birmingham, Ala., work 1929-30, approximately \$2,000,000; City and County of Mobile, Ala., 1929-30, approximately \$400,000; City of Thomasville, Ga., 1928, approximately \$700,000; City of Mt. Dora, Florida, 1927, approximately, \$800,000.

**West Construction Co., of North Carolina,** was incorporated in 1929 under the laws of Delaware. A. K. Barrus is President of this company which operates principally in the States of North and South Carolina and Virginia. The major contracts of the West Construction Co. of North Carolina since its organization have been with the State Highway Department of North Carolina, about 40 miles of road construction, costing approximately \$435,000.

**West Construction Co., of Tennessee,** also a Delaware corporation, was organized in 1929. A. J. White is President of this company which operates principally in the States of Arkansas, Mississippi and Florida. The major contracts of the West Construction Co. of Tennessee since its organization have been Arkansas highway work, about 10 miles, costing approximately \$125,000, and about 17 miles of Florida State Highway work costing approximately \$155,000.

All of these companies maintain a joint general office at Chattanooga, Tenn., with branch offices in the field where the work is located. An arrangement for exchange of organization and equipment is effective whenever required. The business volume of these four "West" organizations is from \$2,000,000 to \$5,000,000 annually. All of these companies are engaged in a similar class of work and specialize in the construction of hot-mix asphalt street and road pavements.

**Niels Ohlsen, Chicago, Ill.,** 3452 South La Salle St. Organized: 1900. Bus. vol. E. Officers: Niels Ohlsen, owner. Major contracts: grading for sidewalks, streets, yards and playgrounds for Chicago. Member: Illinois Manufacturers Assn.; Chicago Association of Commerce.

Who's Who  
*Among*  
Manufacturers  
*in the*  
Construction Field

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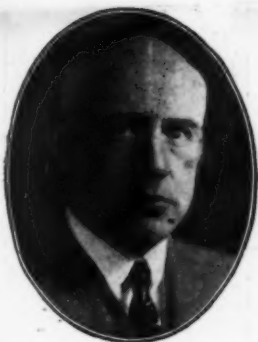
*The*  
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J. N. Heitzel, President and  
Treasurer, Heitzel Steel Form  
& Iron Co., Warren, Ohio



Morgan Ramsay, Sales Mgr.,  
Bay City Shovels, Inc., Bay  
City, Mich.



S. F. Beatty, President, Austin-  
Western Road Machinery Co.,  
Chicago, Ill.



G. K. Specht, Jr., Vice President  
(Distribution), Hercules Prod-  
ucts, Inc., Evansville, Ind.



Robert W. Gotshall, Sales Man-  
ager, Monarch Tractors Div.,  
Allis-Chalmers Mfg. Co., Spring-  
field, Ill.



C. F. Reuter, District Mgr.,  
Allis-Chalmers Mfg. Co., Mont-  
real, Quebec



H. C. Merritt, Manager, Mon-  
arch Tractors Division, Allis-  
Chalmers Mfg. Co., Springfield,  
Ill.



Frank Moore Studio  
G. L. Harman, Industrial  
Brownhoist Corp., Cleveland,  
Ohio



M. R. Butler, Pres. & Gen.  
Mgr., Butler Bin Co., Wauke-  
sha, Wisc.



A. R. Morton, Vice Pres. in  
Charge of Sales & Advertising,  
Butler Bin Co., Waukesha,  
Wisc.



R. C. Holcomb, Service Mgr.,  
National Carbide Sales Corp.,  
New York, N. Y.



George B. Curd, District Sales  
Manager, Northwest Engineer-  
ing Co., Cincinnati, Ohio



Photo by Blank & Stoller  
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in Charge of Sales, McKiernan-  
Terry Corp., New York, N. Y.



Earle R. Evans, Vice Pres.,  
in Charge of Field Operations,  
McKiernan-Terry Corp., New  
York, N. Y.



J. Vale Downie, Sales Manager,  
Keystone Driller Co., Beaver  
Falls, Pa.



C. M. Ballard, Sales Manager,  
Williamsport Wire Rope Co.,  
Chicago, Ill.



C. A. Luster, President, Clyde  
Iron Works Sales Co., Duluth,  
Minn.



J. T. Frost, General Sales Man-  
ager, Clyde Iron Works Sales  
Co., Duluth, Minn.



Frank Moore Studio  
Lion Gardiner, Pres., Lake-  
wood Eng. Co., Columbus, Ohio



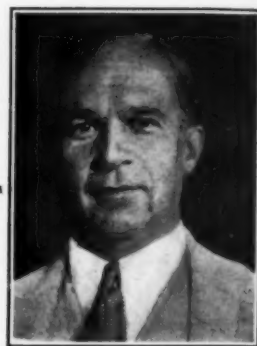
Charles A. Rogers, President,  
Rogers Bros. Corp., Albion, Pa.



Alexander F. Jenkins, Presi-  
dent and Treasurer, The Alex-  
ander Milburn Co., Baltimore,  
Md.



G. W. Breiel, Managing Di-  
rector, Armco Distributors'  
Assn. of Amer., Middletown, O.



Howard S. Johnson, Vice Pres.  
in Charge of Sales, American  
Hoist & Derrick Co., St. Paul,  
Minn.



Louis J. Rogers, Vice Presi-  
dent, Rogers Bros. Corp., Al-  
bion, Pa.



W. E. Barbour, Sales Manager,  
Domestic Engine & Pump Co.,  
Shippensburg, Pa.



W. A. Gordon, Sales Manager,  
General Wheelbarrow Co.,  
Cleveland, Ohio



Howard O. McMillan, Presi-  
dent, M & M Wire Clamp Co.,  
Minneapolis, Minn.



Hugh L. Rogers, Secretary,  
Rogers Bros. Corp., Albion, Pa.



R. S. Cooper, Pres., Indepen-  
dent Pneumatic Tool Co., Chi-  
cago, Ill.



M. J. Harkless, Mgr., Con-  
tractors Dept., Independent  
Pneumatic Tool Co., Chicago,  
Ill.



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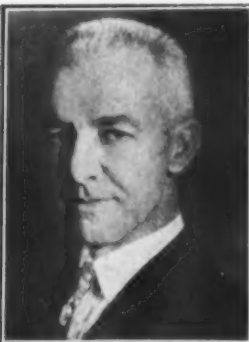
C. N. Maurer, Dir., Highway Sales Div., The Heil Co., Milwaukee, Wisc.



Julius F. Heil, Pres., The Heil Co., Milwaukee, Wisc.



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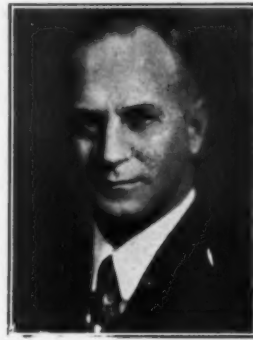
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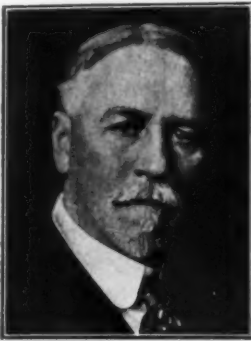
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Ed. B. Goodwin, Eastern District Mgr., New York Office, Novo Engine Co., Lansing, Mich.



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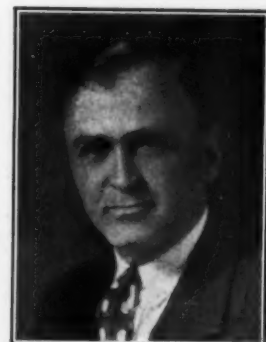
W. R. Meadows, President, W. R. Meadows, Inc., Elgin, Ill.



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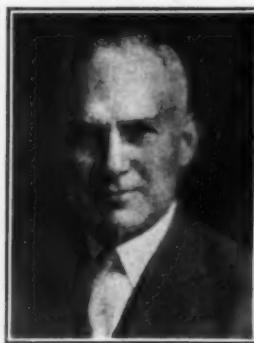
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sentative, E. D. Etnyre & Co.,  
Inc., Oregon, Ill.



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Good Roads Machinery Co.,  
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chinery Co., Dunellen, N. J.



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F. L. Stone, Gen. Sales Mgr., Universal Atlas Cement Co., Chicago, Ill.



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Allan Jackson, Director & Vice President of Marketing, Standard Oil Co. of Ind., Chicago, Ill.



F. H. Moore, Secretary-Treasurer, Equitable Asphalt Maintenance Co., Kansas City, Mo.





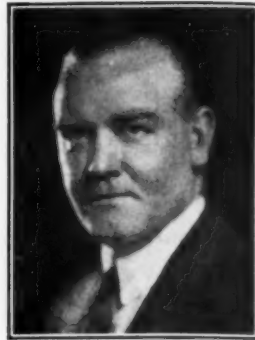
W. S. Godwin, President, W. S. Godwin Co., Inc., Baltimore, Md.



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A. B. Shufeldt, General Manager, Universal Road Machinery Co., Kingston, N. Y.



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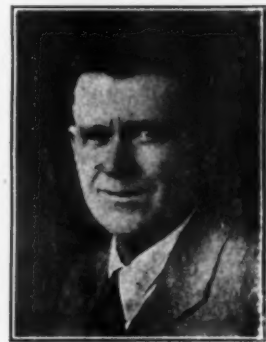
Edwin F. Jones, District Mgr., Erie Steel Construction Co., Erie, Pa.



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A. L. Shaw, President, Chicago Automatic Conveyor Co., Chicago, Ill.



Arthur B. Miskin, Manager, Miskin Scraper Works, Ucon, Idaho



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C. L. Brown, President and General Manager, Northfield Iron Co., Northfield, Minn.



C. E. Erickson, Sales Mgr., Northfield Iron Co., Northfield, Minn.



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**A. O. Witt, Manager, Sales Promotion, Schramm, Inc., West Chester, Pa.**



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**F. M. Young, Pres., Young Radiator Co., Racine, Wisc.**



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**H. W. Bonnell, Sales Mgr., Godfrey Conveyor Co., Elkhart, Ind.**



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F. A. Smythe, Pres., Thew Shovel & Universal Crane Companies, Lorain, Ohio



Frank A. Peck, Vice Pres., Thew Shovel & Universal Crane Companies, Lorain, Ohio



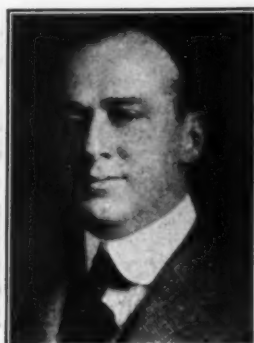
C. B. Smythe, Vice Pres., Thew Shovel & Universal Crane Companies, Lorain, Ohio



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H. A. Hutchins, Mid-Western Sales Mgr., Universal Crane Co., Lorain, Ohio



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H. W. Redman, Chicago Sales Manager, Koppel Industrial Car & Equipment Co., Koppel, Pa.



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C. B. Jahn, Sales Mgr., Commercial Sales Div., Highway Trailer Co., Edgerton, Wisc.



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Carey Co., Cincinnati, Ohio



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Co., Cleveland, Ohio



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Sales Mgr., Moritz - Bennett  
Corp., Elmhurst, Ill.



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N. Y.



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Marion, Ohio



J. R. Bakstad, Mgr., Crusher &  
Pulverizer Sales, Jeffrey Manu-  
facturing Co., Columbus, Ohio



Blaine S. Smith, President,  
Pennsylvania - Dixie Cement  
Corp., New York, N. Y.



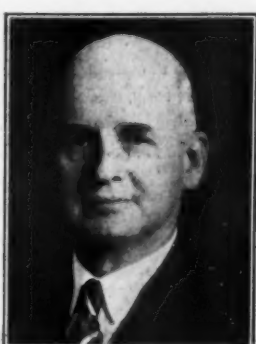
Lorimer Dunlevy, President,  
Muskegon Pump & Generator  
Co., Muskegon, Mich.



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Universal Hoist & Manufac-  
turing Co., Cedar Falls, Iowa





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C. E. Funk, Eastern Sales Mgr., Construction Machinery Co., Waterloo, Iowa



R. E. Choate, Pres. and Gen. Mgr., LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa

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## Maintaining Steel Cutters on Hydraulic Dredges

THE maintenance of a fleet of dredges engaged constantly in harbor improvement work, particularly where they are working in sand, is a serious piece of work. The Sanford & Brooks Co., of Dundalk, Md., has had considerable experience and difficulty from the wearing away of the steel cutter blades on its dredges, due to the abrasive action of sand. The rotary cutters consist of a steel casting having six spiral blades, extending from an annular base and terminating in a central point which is attached to the drive shaft. A heavy frame known as the ladder supports the drive shaft and the cutter. One end of the ladder is attached to the deck of the dredge and operates in the manner of a hinge so that the cutter can be raised or lowered by a hoisting boom. On the underside of the ladder is the suction pipe. The sand is loosened by the rotary cutter and drawn through the pipe by a centrifugal pump and forced out at the point of disposal.

The six cutter blades are about 12 inches wide, 1 inch thick and taper  $\frac{3}{8}$ -inch at the cutting edge. New cutters are expen-

sive; lost time and labor in changing cutters is costly if a harbor improvement job is in progress, so that some means of lengthening the life of these blades is highly desirable. When this first arose, the company decided to apply Haynes Stellite to some parts of the cutting edges of the blades of one of the cutters as an experiment. Since this hard facing was at that time only a test, an insufficient amount was applied to protect the whole cutter; but it was enough to show the resistance of this material to the abrasive action of the sand as compared with that of ordinary steel or manganese steel. At the end of one year the sand cutter was removed from service and inspected. The hard faced parts were only slightly worn while the uncoated metal of the cutter was worn away to such an extent that an early replacement was necessary. As a result of this test, the Sanford & Brooks Co. now hard faces all of its cutter blades with Haynes Stellite. Sections of the blades about 4 inches wide and 25 inches long are hard faced along the edges. This procedure has increased the life of these cutters many times and has effected savings in both time and money.

# Legal Points for Contractors

*These brief abstracts of court decisions in the contracting field may aid you in avoiding legal difficulties. Local ordinances or state laws may alter the conditions in your community. If in doubt consult your own attorney*

Edited by A. L. H. Street, Attorney-at-Law

## Ocean Was Deeper Than the Contractor Supposed

A contractor's erroneous ocean notion and failure to promptly protest against work as not being covered by his contract entailed heavy money loss upon him. The contract called for construction of an 800-foot jetty into the Atlantic Ocean for a city.

After the work was done, the contractor claimed reimbursement from the city on account of loss sustained because the actual soundings were much deeper than the city had represented. The specifications stated that the soundings had been very recently made, whereas, in fact, it appeared that they were made many years earlier. But in an opinion filed March 4, 1930, in the case of *Howland v. City of Asbury Park*, 149 Atl. 115, the New Jersey Supreme Court said:

"We think this contention is without legal support. The twenty-sixth section of the contract provided as follows: 'The total amount of material to be used will depend upon conditions which the contractor must determine to his own satisfaction by actual examination of the site of the proposed work, either by soundings or other measurements, and reference to the plans covering the proposed structure.' The contract further provided that: 'If the contractor considers any work required of him to be outside the requirements of the contract, he shall ask for written instructions or decision immediately and then file a written protest with the engineer against the same within five days thereafter.' The proofs showed that the contractor never made any claim to the municipality that the supplying of this extra material made necessary by the fact that the ocean bed was deeper than was represented by the specifications, imposed upon him the burden of doing work outside of the requirements of the contract, and that he was entitled to extra compensation therefor. On the contrary, he completed his work, accepted the payments which fell due from time to time without any suggestion that he was entitled to receive from the municipality more than the contract price."

## A Thing May Be "Water-Tight" and Yet Have a Few Leaks in It

Work, like a sewer, is not to be measured by the same standards as some delicate instrument when both are required to be "water-tight." This is shown by what the New Jersey Supreme Court decided in the recent case of *Jose Naples, Inc., v. Great Notch Development Co.*, 149 Atl. 33.

Defendant company resisted payment for a sewer job on the ground that it had not been constructed substantially water-tight. But the court said that the word "water-tight" must not be taken too seriously. Said the court:

"According to the testimony of expert engineers, it appears that the term 'water-tight sewer' did not demand a strictly water-tight sewer; it did not demand that the sewer be absolutely free from water, and that, even if 3 inches of water collected in the pipes, that circumstance would not make 'a sewer not water-tight, but that some water might be anticipated in a water-tight sewer.'"

This seems to make it fairly clear that a sewer is not to be classed with the "wets" merely because it is not "bone dry."

## Novel Defense Against Liability for Negligent Excavation Fails

"It may be that you are right when you say that we did not use as much care as we should have used in excavating next to your premises," admitted a California construction company. "and it is clear that the premises occupied by you as sublessees were damaged. But you are not aggrieved legally, because you could have surrendered your lease on the landlord failing to put the building in order again."

The company failed to "get away" with this argument, for the California District Court of Appeal said in the case of *Barrows v. Wm. Simpson Construction Co.*, 283 Pac. 100:

"If the excavating contractor's argument be sound, then it could negligently and wantonly destroy the entire building and then say to the occupants: 'You can not recover damages from us because you had the right to terminate the lease and move out, which you did not do, therefore we are immune from damages, no matter how valuable your leasehold may have been.' This would put a premium upon the wanton and negligent destruction of leased property, and is certainly not the law."

## Highway Contractor Couldn't Shift Accident Liability to Bridge Subcontractor

"While I was going home at 10 o'clock last night on that unfinished highway you are building for the State of Missouri, my car was demolished through failing to take a detour bridge," said a Missourian to a general highway contractor. "And the whole fault was your failure to place proper warnings and guards. I want damages."

"Glad you escaped personal injury, and sorry that your car was damaged," replied the con. "But, you know, I am no more at fault for that accident than Mussolini. I sublet the building of the bridge to Humphreys & Stebbins, and you'll have to look to them for your damages."

Failing to agree on the question of liability, the car owner and the contractor called in a flock of lawyers, but they could not agree, and that meant a lawsuit that went through two courts. The contractor thought the circuit court was wrong when it decided against him, but the Springfield, Mo., Court of Appeals said the decision was correct. Where "defendant" is mentioned in the following extract from the opinion of the Court of Appeals, it means the general contractor:

"Defendant cannot escape liability on the theory that the failure to place lights or warning signals at or near the point where the detour commenced at the east end of the bridge in question, was the act of an independent contractor. Defendant had undisputed charge of the concrete highway leading to this bridge for a distance of at least 2 miles. It had, by opening this highway, invited the public to use the same and was under a duty to render such highway reasonably safe. It could not delegate that duty to another. The obstruction at the Wahite Bridge rendered the use of the highway dangerous, unless a proper barricade and signal light were maintained. The duty to see that such a barricade or lights or signals reasonably calculated to warn the public of the danger was one imposed on defendant by its contract, by the common law, and by its own act in opening the road to public travel."

## What Are Included in Construction "Materials and Supplies"?

Where a highway contractor gives a bond to secure payment for "materials and supplies used in the performance of this contract" is the bondsman liable for lipsticks and chewing gum furnished to the cook in the construction camp?

If some reader thinks that that is too foolish a question to command serious attention, let him read the following abstract of the decisions handed down by the Alabama Supreme Court in the case of *Union Indemnity Co., v. Handley*, 124 So. 876, finally disposed of December 19, 1929:

A state highway contractor gave a bond containing the clause above quoted and question arose as to whether or not it covered certain articles consumed in performance of the contract. The court held that the following things were covered by the bond to pay for "materials and supplies" used in performing the contract: food for laborers in camp, feed for mules, clothing for laborers (including shoes), axes, hammers, pick handles, harness, soap, cups, tubs, spoons, etc. The opinion adds:

"As for the items of tobacco and cigarettes, the court is unable to deny that these articles too may have contributed something to the human energy put into the construction of this road by the employees of the contractor, and hence were worth paying for, and their reasonable price a proper charge against the liability assumed by the bonding company."

## Subcontractors Are Bound by General Contract

"What you may have agreed to with the owner is nothing in our young lives," declared subcontractors on an Iowa job to the general contractor. "Therefore, we are not interested in what provisions there may be in that contract."

But, when litigation over the subject reached the Iowa Supreme Court, the subcontractors found that they were in error, for that court said (*Lantz v. Goodwin*, 231 N. W. 331):

"The defendant as principal contractor, in effect, sublet a part of his contract to the plaintiffs, as subcontractors. They recognized themselves as such and filed a mechanic's lien as such, although they are not foreclosing the same. A principal contractor can get no benefit from his contract with a subcontractor unless the subcontractor complies with the requirements of the principal contract. It is the generally accepted rule of law in such a case that the subcontractor impliedly undertakes to conform to the requirements of the principal contract in the performance of the subcontract."

## Engineer's Certificate Presumptively Correct

"Payments will be made on certificate of the engineer on completion of the work, to the satisfaction of the company and engineer," etc., read a New Jersey sewer construction contract.

Under this clause, the New Jersey Supreme Court decided (*Jose Naples, Inc., v. Great Notch Development Co.*, 149 Atl. 33) that the company, the owner, could not successfully maintain that the contractor was not entitled to recover without proving that the work was done to the satisfaction of both the engineer and the company, although the engineer had issued a certificate. The engineer testified that he issued the certi-

cate in good faith, and the owner made no claim that the certificate had been issued fraudulently or in bad faith. The court said:

"While it is true that the certificate does not show on its face in words at length that the work was done to the satisfaction of the engineer, . . . the fact that the engineer gave the certificate . . . expressed a satisfaction by him of the work done by actual deed. The engineer was the defendant's engineer, and his act was the act of the employer. His satisfaction of the work done was the satisfaction of the company, his employer."

## Burdens Incident to Difficulties in Excavating

A bride may with impunity say, "I do," when the parson asks her whether she will "love, honor and obey" her lord and master, with a secret reservation that she will make him toe the mark and know who's boss. But when a contractor takes unto himself a contract, instead of a bride, and is, in effect, asked if he will do so and so, he'd better pause and meditate before he says, "I do."

Let us illustrate by referring to a lawsuit that arose under a very common contract provision.

A sewer construction contract recited that the contractor had examined the site and fully informed himself as to its condition. Difficulties in exca-

vatating were met when trenches were being dug, but the Louisiana Supreme Court decided that they were part of the "bitter" that went with the "sweet" when the contract was taken; that the contractor took the site "for better or for worse." (*Terrill Construction Co. v. Town of Pineville*, 123 So. 611.) In view of the contract recital above mentioned, the court said:

"Plaintiff [the contractor] is therefore presumed to have known the depth of the excavations on Melrose Street, the fact that the gas main of the Southern Gas Company was located on that street, and in close proximity to the sewer line to be excavated."

## Statute Restricting Character of Labor Usable on Public Works Upheld

Just as a private owner has a right to say that he will not hire red-headed men, or none other, on a building being erected by him, the several states have a right to discriminate in favor of local labor. The latest decision on this point was handed down by the Louisiana Supreme Court in the case of *State v. Caldwell*, 129 So. 368. In that case, the court upheld the validity of a Louisiana statute, forbidding the employment on public works of mechanics not qualified voters of the state, where workmen who are qualified voters are obtainable.

The court cites an opinion of the highest court of the land, stating "that it belongs to the state as the guardian and trustee of its people . . . and, having control of its affairs, to prescribe the conditions upon which it will permit public work to be done on its behalf or on behalf of its municipalities, and no court has authority to review its action in that respect."

The Louisiana court adds: "It is therefore from its status as master in its own house with reference to the construction of public works, rather than from its status as legislator, that the state derives its right 'to prescribe the conditions upon which it will permit public work to be done in its behalf or on behalf of its municipalities.'"



## Construction Industry News

**Michigan Power Shovel Co.**, has been adopted as the new name of the Detroit Power Shovel Co., which has recently been moved to Benton Harbor, Mich. The newly-elected officers of this company are H. B. Ross, President of the Ross Carrier Co., Chairman of the Board; W. E. Bernhard, President and Chief Engineer; D. H. Millard, Vice President and Sales Manager; Don C. Abbott, Secretary and Treasurer; H. E. Wynne, D. H. Ross and A. Abbott, Directors.

**Novo Engine Co.**, Lansing, Mich., has announced the appointment of the A. E. Hudson Co., 311 Franklin Street, Peoria, Ill., as distributor for Novo products and repair parts.

**American Tractor Equipment Co.**, 5301 Horton Street, Oakland, Calif., and Peoria, Ill., has announced the appointment of N. G. Livingston as Eastern Sales Manager. Mr. Livingston will operate from the plant at 1321 S. Washington Street, Peoria, Ill.

**Moon Track Co.**, Chicago, Ill., manufacturers of semi-crawler tracks for McCormick-Deering tractors, has established a separate Industrial Division at its present office. R. W. Moon, Vice President and General Manager, has announced that this move was made to take care of the increasing demand from manufacturers, distributors and contractors for Moon tracks.

**The American Hoist & Derrick Co.**, St. Paul, Minn., has announced that in order to improve its service in the Chicago area where it has offices at 205 W. Wacker Drive, it has purchased warehouse facilities which will enable it to carry complete stocks of new machines and repair parts for prompt service of all users of American hoisting machinery.

**Footo Co., Inc.**, Nunda, N. Y., has announced that Charles A. Lynch, formerly Manager of Engineering and Sales for the Fort Pitt Steel Castings Co., McKeesport, Pa., has been appointed Vice President and General Manager of Footo Co. He has been identified with the steel castings industry for 23 years, and for the past 5 years has been engaged in an intensive study of machines and equipment materials.

**Aeroil Burner Co., Inc.**, Park Avenue at 13th Street, West New York, N. J., has announced the appointment of Herbert M. Orschel as Field Sales Manager. He will travel extensively throughout the United States and Canada, and hopes through personal contact to increase the general scope of this company's activities.

### The Proper Spirit

**A**N interesting example of the need of more secondary good roads and also of the fine spirit of cooperation and helpfulness between contractors is shown in a story which appeared in the *Lone Star Constructor*.

In a little town of Levelland, up in the Panhandle, bids were being taken for the construction of a school house. To attend the letting, bidders had to drive over many miles of muddy road; and when the hour for receiving bids came

around, one bidder still was absent—George Parr of Amarillo.

A few minutes later, the president of the school board was called to the telephone, where he learned that Mr. Parr's car was stuck in the mud out on the highway and that Mr. Parr could not get to town for the letting. But the president received Mr. Parr's bid over the phone.

When he returned to the bidders, the president reported the facts to them and asked whether or not Mr. Parr's bid tendered in such an informal manner, should be accepted. Without an exception, the bidders requested that the bid be given the same consideration as that shown all others. The bids were opened and tabulated, and Mr. Parr's bid was low.

The president then reminded the bidders that this bid was unaccompanied by the usual bid check and suggested that, under the circumstances, the bid should not be considered. Without an instant of hesitation, however, J. B. Maxey of Lubbock answered: "My bid is higher than Parr's. Take my check and put it with his bid."

We can think of no finer illustration than this of the spirit needed to make the construction industry what it should be. Not only did the approval of the informal bid speak highly for Mr. Parr's integrity and reputation, but Mr. Maxey's ready protection of his fellow contractor's interests exhibited a spirit which we all might well emulate.

## Distributors' Bulletin Board

*The distributors of construction equipment listed below have made changes in their cards appearing in the Distributors' Directory on pages 167 to 194 of this issue of CONTRACTORS AND ENGINEERS MONTHLY:*

Allegheny Equipment Corp., Pittsburgh, Pa.  
O. B. Avery Co., Saint Louis, Mo.  
Arizona Tractor & Equipment Co., Phoenix, Ariz.  
Edward R. Bacon Co., San Francisco, Calif.  
Bailey-Treen Machinery Co., Huntington, West Va.  
Bashford-McCord Corp., Rochester, N. Y.  
Barnard Tractor and Equipment Co., Inc., Harrisburg, Pa.  
Bay City Foundry & Machine Co., Bay City, Mich.  
Bowman-Ralston Tractor & Equipment Co., Evansville, Ind.  
Brewster & Williams, Inc., Syracuse, N. Y.  
Brown, Fraser & Co., Ltd., Vancouver, B. C.  
Carolina Contractors Equipment & Supply Co., Columbia, S. C.  
The Central Garage, Medicine Hat, Alberta  
Z. T. Darrow & Son, Canandaigua, New York  
The Day & Maddock Co., Cleveland, Ohio  
Drake Tractor and Equipment Co., Rome, N. Y.  
Eken Tractor & Equipment Co., Minot, N. D.  
R. B. Everett & Co., Houston, Texas  
F. W. Gartner Co., Houston, Texas  
General Equipment Co., Inc., Clarksburg, West Va.  
A. E. Hudson Co., Peoria, Ill.  
Keller Tractor & Shovel Co., Inc., Detroit, Mich.  
McDonald Tractor Equipment Co., Orlando, Fla.  
E. A. Martin Machinery Co., Joplin, Mo.  
W. B. May, Inc., Buffalo, N. Y.  
Morrison Tractor & Equipment Co., Ltd., Vancouver, B. C.  
W. A. Nelson Equipment Co., Milwaukee, Wis.  
North Jersey Tractor Co., Inc., Garwood, N. J.  
Ohio Valley Truck & Equipment Co., Marietta, Ohio  
E. F. Pegg Equipment Co., Cleveland, Ohio  
Perry and Wilson Equipment Co., Indianapolis, Ind.  
T. L. Pitts & Son, Charlotte, N. C.  
The Porter Supply Co., Huntington, West Va.  
The Prues Equipment Co., Cincinnati, Ohio  
Rapp-Huckins Co., Inc., Boston, Mass.  
Sheehan & Co., El Paso, Texas  
The Taylor Tractor Co., Columbus, Ohio  
The Tractor & Equipment Co., Chicago, Ill.  
The Robt. R. Twedt Co., Cheyenne, Wyo.  
M. B. Tyler Co., Springfield, Mass.  
Wm. H. Ziegler Co., Inc., Minneapolis, Minn.




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## The Editor Comments —

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### Wise Spending Versus Unemployment

During the summer one of the questions which I met most frequently was, "What do you think of business conditions?" During the last three months this question has changed to "What do you think about unemployment?" I shall take this opportunity to state my beliefs regarding the present situation. Most of the suggested cures which I have studied have been either nebulous, suggested for the sake of the publicity they would secure or downright charitable propositions. I believe that most people have taken the wrong attitude toward the present altogether too general problem of unemployment.

The American people believe in advertising. American manufacturers know that it pays to advertise what they want to sell. The more you talk about some one thing in particular, orally or in type, the more strongly it is impressed upon the minds of those who hear or read. Perhaps the most outstanding example of this in the past was the firm belief of the American people in German atrocities early in 1914, atrocities which never happened according to recent revelations by English governmental officials, but which were thought up to create a favorable reaction in American hearts and minds.

Everybody has been talking unemployment. Newspapers have advertised it assiduously through scareheads and miles of columns of type. In my humble opinion it might be better to devote much more space to selling to the American public the fact that today the wage earner's dollar has a vastly greater purchasing power than for many years. Staple articles, necessities and luxuries can be bought for less than they could a year ago. I have talked with many Christmas shoppers and have learned that they all found that they could purchase more this year with their Christmas money than last year.

Don't you think that if this fact were advertised sufficiently with reasonable stress on the effect of a wave of buying in rapidly increasing general employment to restock the shelves of our merchants and the stock of our construction equipment distributors, there would be a very rapid decrease in the period of hibernation of the American dollar. It would also reduce the embarrassingly large hoard in the savings banks, which has made necessary the reduction in the interest rate paid.

I am not going to suggest that "we appoint a committee" nor even endeavor to get Congress to appropriate a billion or two for advertising, but I am going to ask you to help me talk this idea to thousands upon thousands of men and women and thus do a real job in helping overcome the present unfortunate condition without recourse to scareheads. Will you pull with me?

### A Winter Job Helps Reduce Unemployment

An example of a well thought out scheme for helping labor comes to us through the Newark, N. J., *Evening News*. The bed of the Morris Canal long ago abandoned as a Canal and used chiefly for the surreptitious disposal of refuse, is to be converted into a subsurface roadway. The job will require the excavation of 170,000 cubic yards of material in one section. The work originally to be done by contract has been arranged so that about one-third of the excavation on this section will be done by hand labor before the contractor can economically start excavation with his power shovel in the spring. This will relieve unemployment in the interim, speed up the work and still leave the contractor free to proceed with normal methods, using skilled labor and not throwing his invested capital and his skilled labor out of employment.

All power to Newark and the thoughtful administration which is helping the needy and not at the same time pillorying the taxpayer. We hope that there are hundreds of other cities like her throughout the length and breadth of these United States who are proceeding along rational lines, and neither making beggars out of willing workers or substituting hand labor for economical machine work in construction or factories to the detriment of our civilization.

We must not set our civilization back by discarding the machines which have brought us to our present state of efficiency. Use hand labor where it fits in effectively but remember that every man out of employment is not physically fit to swing a pick. If every employed man and woman will spend wisely today, more will be employed tomorrow.

### More Money for Road Work

Thanks to forty-six States and the American Road Builders Association, in this issue we are able to report quite completely the comparative funds available for State highway construction and maintenance for the past year and the coming year. Tucked into each report is other information that our readers have been seeking such as: the amount of the gas tax; is that source of income increasing really or only apparently; what part of the gas tax money goes for roads; what part for construction and maintenance; and of greatest interest to the contractor, how great a part of the State money goes to contract work in State highway construction. Look the article over, study it, see what States are forward looking in contracting for maintenance. If you want a copy of this article to file, write me as we are reprinting this material for general distribution.

*Theodore Reed Kendall*

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A Section of  
CONTRACTORS  
AND  
ENGINEERS MONTHLY

Devoted to  
News of Consultants  
in the  
Civil Engineering Field

# The Consulting Engineer

January, 1931

New York

Vol. III, No. 1

## Evaluated Bids for a Refuse Incinerator

*Office of H. Burdett Cleveland, New York*

**A** CONTRACT has been signed for the construction of a refuse incinerator for the Borough of Red Bank, Monmouth County, New Jersey, in accordance with plans prepared by H. BURDETT CLEVELAND, New York.

For some years garbage and rubbish collected by the Borough have been dumped on the river flats but conditions of nuisance, aggravated by fires in the deep accumulation of rubbish, have been set up by this method of disposal and for the past few years garbage has been delivered to and burned at an incinerator in a nearby community at considerable expense to the Borough of Red Bank.

The Borough Council, therefore, requested the preparation of plans and specifications and advertised for bids for the construction of a building and chimney to accommodate two furnace units, each of a capacity to burn 50 tons of refuse in 24 hours. The contract calls for the installation of one 50-ton unit at present, which is to be operated 8 hours, daily.

The Borough is largely residential in character with little manufacturing, but is a well established trading center for a large district. For this reason the proportion of rubbish is very favorable to the incineration of mixed refuse without the use of auxiliary fuel. The population of the Borough is about 12,000.

Careful consideration was given by the Borough Council to the matter of securing a suitable plant and several existing incinerators were visited. Additional land was purchased at the present disposal site to insure economical foundation construction and to provide for a delivery driveway through the plant.

Detailed plans were prepared for the building and stack and the specifications covered each portion of the work, including general specifications for the furnace and auxiliary apparatus.

The plans and specifications were sufficiently broad to admit of free, open competition on a comparable basis but called for strict guarantees accompanied by statements as to performance of the furnace on test after completion, covering labor and power requirements for operation, auxiliary fuel consumption for properly burning a standard mixture of garbage and rubbish of a definite moisture content, maintenance of proper heat in the combustion chamber, size and capac-

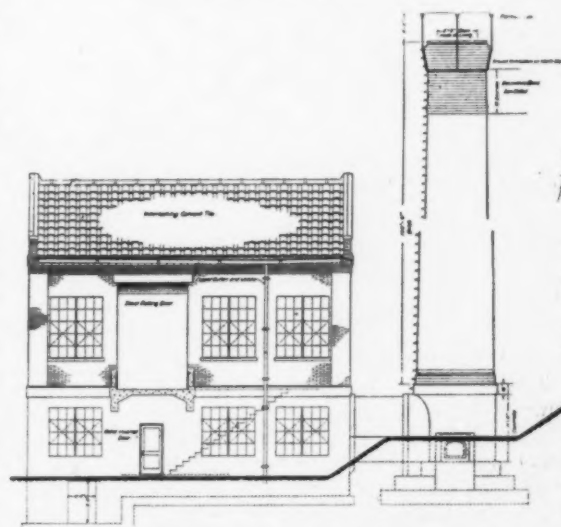
ity of furnace and ability to effectively incinerate refuse at the rated capacity without nuisance, and other specified features.

With reference to auxiliary fuel consumption, the specifications and contract further provided that a specified sum should be deducted from the final payment, as liquidated damages, for each pound of coal or equivalent auxiliary fuel, above a certain amount that should be required, per ton of refuse of the standard composition and moisture content, for proper operation of the plant.

Eight proposals were received for the construction of the plant and the four lowest bids were evaluated on the basis of the guarantees accompanying the bids. Such evaluation took into account the annual operating cost as well as the first cost and included also the expense to the Borough represented by a longer time for completion in the case of three of these bids as incorporated in the proposal.

Among these four bids there was little differentiation with respect to labor costs for operation and there was no differentiation, on the basis of the guarantees

*(Continued on page 124)*



*South Elevation of the Red Bank Incinerator*

# The Consulting Engineer

A Section of  
**Contractors  
and  
Engineers Monthly**

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## Evaluated Bids for a Refuse Incinerator

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accompanying the bids, in the matter of auxiliary fuel consumption. Ratios of power required for operation of forced draft, which are consistent with the design and the operating arrangements and requirements of the furnaces, were as 1:2.2:3.5:3.5.

The evaluation or translation of annual cost for power into equivalent first cost on a 15-year annuity basis resulted in the addition of \$4,541.00 to two of the bids to place all bids on a comparable basis and on this basis the contract was awarded to the Morse Boulger Destructor Co., at a price of \$43,689.00 for the plant complete, with one furnace installed.

## Consulting Briefs

**Charles A. Haskins**, Finance Building, Kansas City, Mo., is now preparing plans for a rolled earth fill dam, 1,850 feet long and 42 feet high to create an impounding reservoir at Augusta, Kansas. He is also preparing plans for a soft water supply for Larned, Kansas. In addition, considerable construction is underway from Mr. Haskins' plans and is being carried on under his direction. This includes paving in Norton and Syracuse, Kansas, and Bonne Terre and Fredericktown, Mo., a new water works system at Leoti, Kans., and sewer extensions at Farmington, Mo.

**Koch & Fowler**, Dallas, Tex., are working on plans for a new sanitary sewer system and disposal plant for Irving, Tex. At the present time a complete new water works is being built for the City of Monahans, Tex., under the supervision of Koch & Fowler by J. B. McCrary Co., contractor, of Dallas, Tex.

**H. L. Thackwell**, Municipal Building, Jacksonville, Tex., is preparing a design for an activated sludge disposal plant at Rusk, Tex., and another sewage treatment plant for Longview, Tex. He is also engaged in a valuation appraisal for a railroad at Livingston, Tex., and a design for the enlargement of the sewage treatment plant at Jacksonville. A street paving job is now under way in Livingston, Tex., under Mr. Thackwell's supervision.

**O. A. Gierlich and H. S. Gierlich**, 302 Citizens Bank Bldg., Monrovia, Calif., are supervising the construction of a well and a reinforced concrete reservoir and water works system for the Clarence Mayer Ranch at Santa Susana, Calif., as well as the installation of a well, pump and pipe line for the Duarte Mutual Irrigation & Canal Co., Duarte, Calif., and streets for the Canon Improvement District, Sierra Madre, Calif. Mr. Gierlich read a paper before the Planning Commission Section of the League of California Municipalities at its annual convention at Long Beach, Calif., on "Opening and Widening Proceedings."

**Patzig Testing Laboratories**, Des Moines, Iowa, recently prepared reports on steel inspection for the Northwestern Bell Telephone Co., Burlington, Iowa, and the joint Oklahoma-Texas Highway Bridge. Inspection of steel for the Oklahoma-Texas Highway Bridge, concrete inspection for the Grocers' Wholesale Building and the new Des Moines Building, both located in Des Moines, as well as the paving inspection at Davenport, Ottumwa and Des Moines, Iowa, were made by this firm.

Mr. Patzig recently prepared a paper entitled "The Control of Materials for Paving Construction."

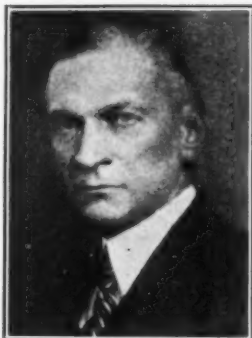
**John R. Nichols**, 45 Newbury St., Boston, Mass., is supervising the construction of the Springfield Hospital, Springfield, Mass., Stevens & Lee, Architects. The contract was awarded to Fred T. Ley & Co.

**Black & Veatch**, 701 Mutual Bldg., Kansas City, Mo., are preparing an appraisal of the water works and a report on water purification for Evansville, Ind.; plans for sewage disposal works for Wichita, Kans., Tulsa, Okla., and Bartlesville, Okla., water purification for Great Falls, Mont.; a water softening plant for Neodesha, Kans., and a pumping station for Tulsa, Okla. The construction of sewers and a sewage disposal plant for Abilene, Kans., the flood control works and water works improvements for Council Grove, Kans., and a power plant for Independence, Mo., is being carried on under the supervision of this firm.



## Water Supply Project at Maybrook, New York

THE office of HENRY W. TAYLOR, Consulting Engineer, 11 Park Place, New York, has for the last eight months been working on a water supply project for Maybrook, New York. The success of the project depended upon the cooperation of the New York, New Haven & Hartford Railroad Co.'s yards at Maybrook. A contract has been made with the railroad for the use of water from the village system and money has been voted for the project by the taxpayers. Mr. Taylor has been retained as consulting engineer for the preparation of plans and specifications and supervision of the construction involved in the project, the cost of which is estimated at \$105,000.



Henry W. Taylor

## Construction Work in Oklahoma

JOHN C. BRADLEY, Vice President, announces that the ROBERT O. BRADLEY Co., Chickasha, Okla., has recently added two assistant engineers to its staff, Henry G. White, a graduate civil engineer from the University of Oklahoma and Robert J. Millar, a graduate civil engineer from the University of Indiana. At present the company is working on plans for a water supply, a sewerage system and paving for Chickasha, Okla., paving and water and sewer systems for Okarche, Okla., and a sanitary sewer system for Tuttle, Okla.

Members of this company have recently been called as expert witnesses in two cases, Bond-Hatcher & Bond vs. Oklahoma Conservancy District No. 1 and Melton & Melton vs. City of Snyder, Okla. Several paving and sanitary projects are now under way under the supervision of Robert O. Bradley Co., including paving in Chickasha, Okla., sanitary sewer extensions in Chickasha, a drainage district for Grady County, Okla., and water main extensions in Carnegie, Okla.

## Sewage Treatment Plant Plans for a Texas City

THE City of Goose Creek, Texas, has employed the MUNICIPAL ENGINEERING Co. of Dallas, Texas, to prepare plans and specifications for a modern sewage disposal plant on the Imhoff principle to take care of the sewage of a population of 8,000 people. When plans are accepted by the City Council, bids will be called for the construction of the plant.

An election is to be called in the near future for the purpose of amending certain provisions of the home rule charter of Goose Creek, which was adopted in May, 1928. One of the important amendments is a proposed change in the name of the City from Goose Creek to Southport, as it has been found that the name Goose Creek has been more or less of a handicap in the marketing of the municipal bonds, according to R. M. Manley, City Manager.

## Who's Who in Engineering

THE third edition of Who's Who in Engineering is now in preparation. Many consulting engineers have already received blanks on which to furnish reports to the Lewis Publishing Co., Broadway at 11th Street, New York City. It is hoped that engineers will furnish accurate and concise reports promptly that this third edition may be even more comprehensive than the first two editions.

## Water Works and Sewerage Projects in Indiana

A NUMBER of water works and sewerage projects are now under way in the office of CHARLES BROSSMAN, Engineer, 1009-1010 Chamber of Commerce Building, Indianapolis, Ind. Among those for which reports and plans are being prepared are sewers and water works for Lawrence, Ind., and Dillsboro, Ind.; a water works for Delphi, Ind.; a sewage disposal system for Berne, Ind.; sewage plant improvements for Lebanon, Ind., and a plan of electrical transmission and distribution for Auburn, Ind.

A dam and reservoir at Balesville, Ind.; a sewage plant for Northwood; a heating plant for the county jail at Columbia City and a sewage disposal plant for Akron, Ind., are being constructed under Mr. Brossman's supervision.

R. H. Lukens, Civil Engineer, and Frank Yarling, Electrical Engineer, have recently joined the staff.

## The Legare Engineering Company

A NEW consulting engineering organization known as the LEGARE ENGINEERING Co. with general offices, Suite 206, 1226 Sumter Street, Columbia, S. C., has been announced, with T. Keith Legare as President. This organization is prepared to furnish a complete engineering service in municipal, highway and industrial engineering, and also a system of advisory service for towns and counties in connection with the operation of public works. Engineers with extensive training and experience in all the principal branches of professional engineering are associated with the organization. Other members of the organization are: J. E. Gibson, Vice President, who is Manager and Engineer, Water Department, Charleston, S. C.; Thomas F. Ball, Secretary-Treasurer, who is Head of the Department of Electrical Engineering of the University of South Carolina; Elroy G. Smith, Consulting Engineer of Augusta, Ga., and G. E. Shand, Consulting Engineer, Columbia, S. C.

## Non-Interpolating Logarithms, Etc.

A BOOK of non-interpolating logarithms, cologarithms, and antilogarithms arranged so as to give 4 and 5-place logarithms and antilogarithms and 4-place cologarithms by mere inspection without any calculation, has been prepared by Frederick W. Johnson, instructor in chemistry, University of California. The aim of the book is to furnish these facilities for ordinary calculations and to entirely obviate the necessity for interpolation or the use of tables of proportional parts. The book is thumb-indexed and is published by the Simplified Series Publishing Co., 1381 Third Avenue, San Francisco, Calif., price \$2.25.

## Connecticut Consulting Firm Changes Name



Henry Robinson Buck

**T**HE engineering firm formerly known as Buck & Sheldon, Inc., Hartford, Conn., has changed its name to HENRY ROBINSON BUCK, INC., with Mr. Buck's son, Henry Wolcott Buck as Secretary of the new organization. Mr. Buck, Senior, resigned as assistant city engineer in 1905 to go into private business, incorporated in 1909 as Buck & Sheldon, Inc., and in 1911 the name was changed to

Ford, Buck & Sheldon. When Mr. Ford was called to New Haven to reorganize the engineering work of that city, the name was changed back again and continued until July, 1929. From that time until Mr. Sheldon retired in July, 1930, he and Mr. Sheldon carried on independent offices at 60 Prospect St.

Henry Robinson Buck, Inc., will continue the practice of sanitary and general consulting engineering under the direct supervision of Mr. Buck, surveying, contour maps and building lot subdivision under Theodore F. Neuhaus, of Windsor, and structural designing and estimating with supervision of erection for owners and architects under Henry Wolcott Buck.

At present the firm is engaged in the preparation of a preliminary report on sewage disposal for the Borough of Farmington, Conn., and a preliminary design and cost estimate of a 700-foot earth dam for Black Rock State Park. Leland E. Evans recently joined the staff.



Henry Wolcott Buck

## Cincinnati Consultants Have Extensive Work in Kentucky

**A** REPORT from W. L. Glazier, GLAZIER & MORLIDGE, 403 Broeman Bldg., Cincinnati, Ohio, states that they have employed eight men regularly for over a year, laid one man off in August but now are holding their own. At present this consulting organization is preparing plans for a sewer system and sewage treatment plant for the town of Fort Muckett, Kenton County, Ky.; a garbage incinerator for the City of Ludlow, Ky., and a combined city building and fire house for Park Hill, Ky.

The organization was called as an expert witness for the City of Cincinnati in a case of the Ninth Street Baptist Church for which damages were claimed during the construction of sewers. Street and sewer work is now under way in Ludlow, Bellevue, Clifton, Fort Thomas, and Park Hill, Ky., under the supervision of Glazier & Morlidge.

## Studies in Reinforced Concrete

**T**HREE British pamphlets, part of a series of studies in reinforced concrete, are available to American readers through the British Library, 551 Fifth Avenue, New York City. Technical pamphlet No. 10, Bond Resistance, price 20 cents, describes experiments made in England to determine the influence of lengths of rod embedded in concrete and the stress in a bar on the bond resistance between steel and concrete. From these experiments a new theory of the distribution of bond stress has developed. The confirmation of this theory has entailed the design and construction of special instruments. Other matters of interest examined are the surface pressures produced by the shrinkage of the concrete around the steel, and the influence of the composition and condition of the concrete on the bond resistance.

Technical Paper No. 11 on Shrinkage Stresses, price 30 cents, describes experiments to determine the distribution of shrinkage stress along a reinforcing bar and outlines approximate methods for allowing for the creep occurring during shrinkage in making calculations for shrinkage stresses. At the same time it makes comparison between the behavior of three typical cements, namely, a normal portland, a rapid-hardening portland and an aluminous cement.

Technical Paper No. 12 on The Creep or Flow of Concrete Under Load, price 30 cents, is the third of the series of studies and refers frequently to references in the two previous papers. The progressive movement which occurs in concrete as a direct result of the load imposed on it has been variously called creep, flow, plastic flow, plastic yield and time yield. The phenomenon is similar in many respects to what has long been known in metallurgy as creep or flow. The work described in this paper has proved that the conclusion reached in 1927 by Dr. Faber was correct in subject and that the methods of stress calculation given in his paper may be accepted as giving an approximation to the stresses that will actually occur. The magnitudes of the errors involved by the use of the approximate methods are also analyzed in the present paper.

## No Quick Rebound to Prosperous Times

**P**LANS and specifications for a water filtration plant, a sewage treatment plant, a street paving and storm sewer system, foundation plans for bank and school buildings are under way in the offices of W. G. STONE & SON, Mann Building, Utica, N. Y. They are also preparing studies for a proposed drainage system near by. J. C. Cassidy has recently been added to the staff.

Mr. Stone reports, "We see no improvement in local conditions. While the projects mentioned above will undoubtedly be constructed, we see no prospect of such construction until 1932. Communities, as well as individuals, are practicing economy and so long as present business conditions remain, we see no probability of municipalities increasing their bonded indebtedness. The ballyhoo and optimistic predictions we read about in our newspapers and technical publications are simply whistlings to keep up their courage. While we have unbounded faith in the future of these United States, those who pin their faith upon an immediate return to normal prosperity, have, in our opinion, another guess coming."

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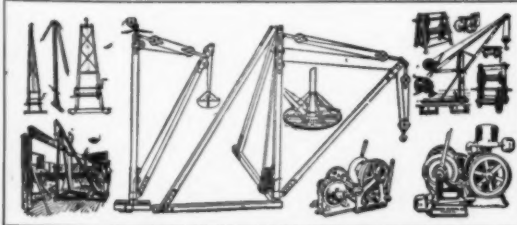
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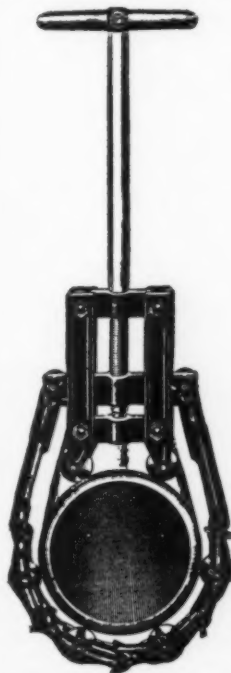
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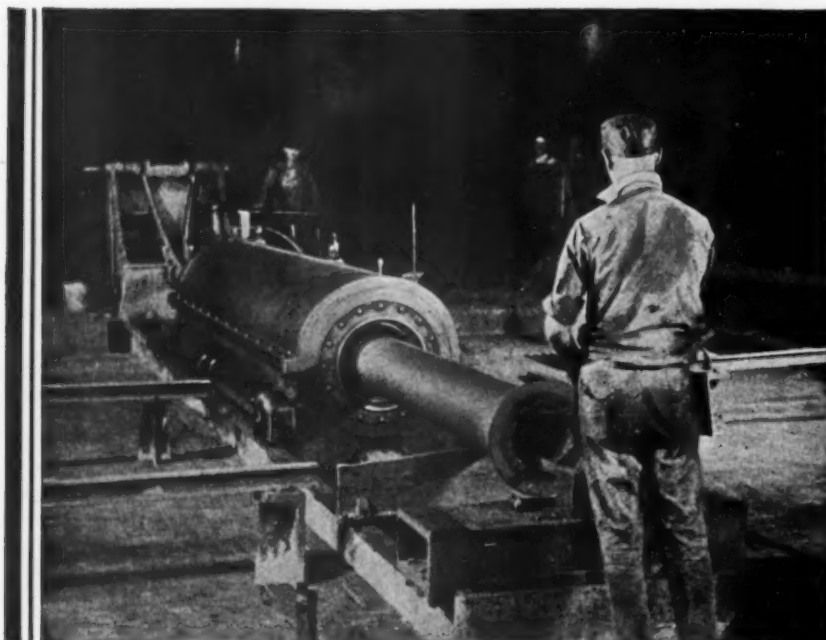
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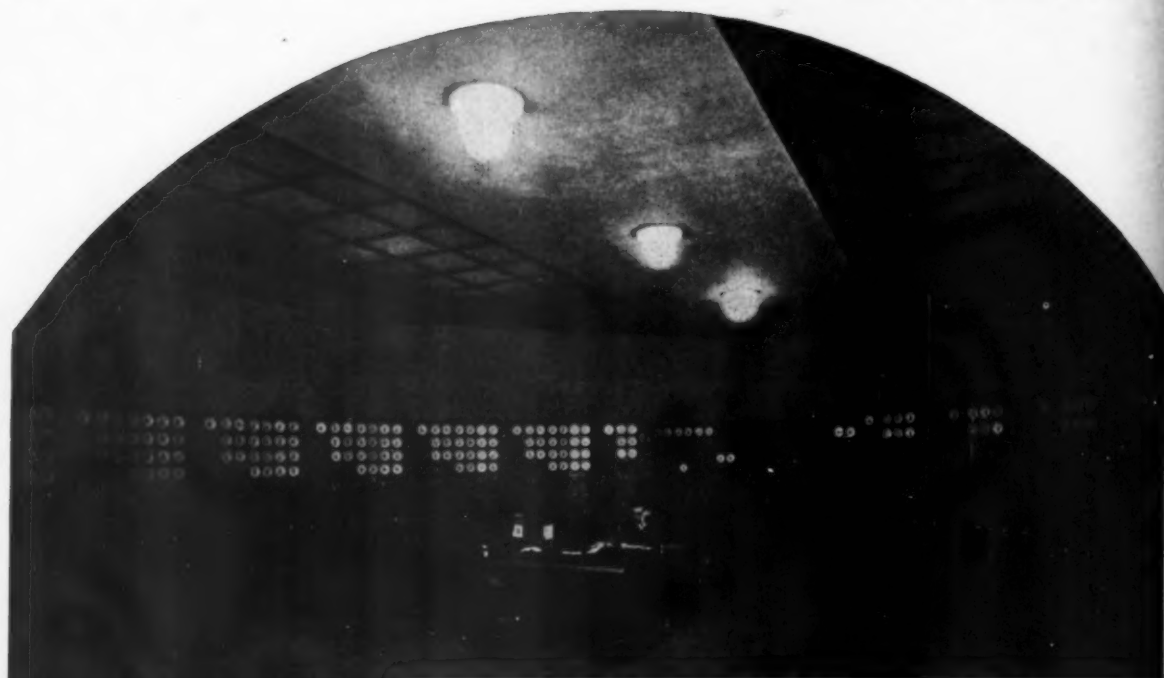
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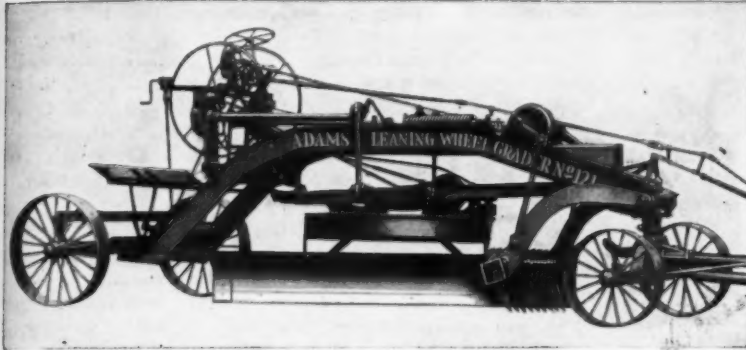
*"The only safe water is a sterilized water"*







## Road Show Notes

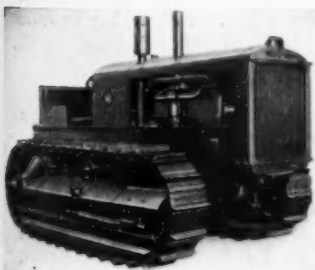


*The New No. 121 Leaning Wheel Grader*

**J. D. Adams Co.,** Indianapolis, Ind., will display a new type of Adams leaning wheel grader which offers new possibilities in wide range blade adjustments. An elevating grader introducing several new features, and motor graders will be shown just inside the entrance of Exhibition Building A which adjoins the Arena on the east.

**Aerol-Burner Co., Inc.,** West New York, N. J., will exhibit in Space B-118 its oil-burning asphalt kettles, asphalt and emulsion sprayers, paving tool heaters, concrete heaters, pouring pots and joint fillers, portable tool boxes and kerosene burners for road oil distributors. George P. Kittel, Pres.; Herbert M. Orschel, General Field Sales Mgr., and Robert S. Arthur, Chicago Branch Mgr., will be in attendance.

**Allis-Chalmers Manufacturing Co.,** Monarch Tractors Division, Springfield, Ill., will display a narrow tread, a solid-tired and a pneumatic-tired Model U industrial tractor, a Monarch 35, a Monarch 50 and a Monarch 75 at Booth A-30. The exhibit will be in charge of A. A. Kaehler, Sales Promotion Supervisor and W. Ellzey Brown, Industrial Sales



*An Allis-Chalmers-Monarch 35 Tractor*

**Aluminum Co. of America,** Pittsburgh, Pa., has been assigned Booth A-62 and will exhibit an aluminum truck body, an aluminized road form, a concrete mixer, an aluminum shovel and aluminum paint.

**American Fork & Hoe Co.,** successor to Skelton Shovel Co., Inc., Dunkirk, N. Y., will exhibit at Booth B-77 its line of hand shovels, scoops, and asphalt rakes such as used for highway construction. H. C. Branahl, Sales Mgr.;

Other representatives in attendance will be H. C. Merritt, Mgr. of Tractor Division; R. W. Gotshall, Sales Mgr., Monarch Tractor Division; L. L. Hartl, Asst. Sales Mgr.; G. F. Andrews, Service Mgr.; D. F. Ritchie, Equipment Sales Engr.; W. E. Yunker, Mgr., Springfield Works.

C. A. Trigg, Asst. Sales Mgr., and E. W. McCarty, Vice Pres., will be in attendance.

**American Steel & Wire Co.,** Chicago, Ill., will have on exhibition in Booth A-73 triangle mesh and electric-weld wire reinforcing fabric for the reinforcing of roads and streets, steel posts for highway signs, snow fences and woven wire fences, American wire rope for highway machinery and Perfected guard rail for highway protection. The following representatives of the company will be in attendance: B. S. Pease, O. T. Allen, P. T. Coons, D. E. Hinman, E. J. McCarthy, H. E. McCann, J. J. Reagan, H. D. Worthington, R. C. Groesbeck, E. B. Slason, W. H. Kremer, F. B. Kane, O. S. Moessmer, F. J. Oestreicher, W. H. Cordes, W. E. Ivins, H. A. Jones, M. E. Jones, C. F. Wiley and R. S. Green.

**American Tar Products Co.,** Pittsburgh, Pa., will maintain a lounge for its friends at Booth A-50.

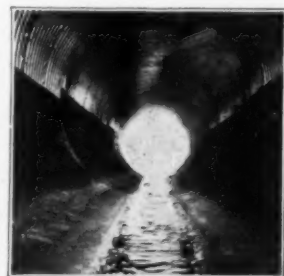
**American Tractor Equipment Co.,** Oakland, Calif., will have an exhibit consisting chiefly of photographs and moving pictures of its entire line of dirmovers, bulldozers, scarifiers and tamping rollers in action. Its representatives at the Road Show will be Edward R. Bacon, Pres., and N. G. Livingston, Eastern Sales Mgr., whose headquarters are at Peoria, Ill. The exhibit is at Booth A-27a.

**Amiesite Asphalt Co. of America,** Philadelphia, Pa., will show samples of Amiesite paving materials at Booth A-47. Representatives attending the Show will be D. M. Hepburn, Pres.; G. K. Preston, Sec.; J. N. Emory, Engr.; William Halton, Pres., Halton Amiesite Co., Mt. Vernon, N. Y.; Richard Halton, Vice Pres., Halton Amiesite Co., Mt. Vernon, N. Y.; George B. Carey, Pres. and W. E. Lehman, Vice Pres., Southern Amiesite Co., Lexington, Ky. and W. H. Hall, Pres., W. H. Hall Construction Co., Hartford, Conn.

**Anthony Co., Inc.,** Streator, Ill., will display in Booth 31-B an Anthony heavy-duty pipeless hydraulic hoist dump body, a rotating power hoist and an Anthony roller rocker gravity dump body.

**Armeo Culvert Manufacturers' Assn.,** Middletown, Ohio, will feature its latest development in iron pipe for drainage, the multiple paved invert pipe which is provided with two or more pavements, dependent on the diameter of the pipe, and presents a smooth wear-resisting trough in the invert of the culvert where the erosive action of the abrasive materials is concentrated. Specimens of

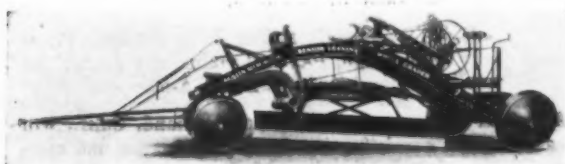
Armeo perforated pipe, with photographs and drawings as well as a running water model including both paved invert and perforated iron pipe, will be on display. The exhibit will be located in Space A-119 and the following representatives will be in attendance: S. R. Ives, Vice Pres. and Gen. Mgr.; George E. Shafer, Engineer of Tests; M. C. Noble and H. W. Gregory, Regional Mgrs., and H. S. Claybaugh.



*The New Multiple Paved Invert Pipe*

**The Asphalt Institute**, New York, N. Y., will exhibit in Space A-125 a series of models showing stage construction possibilities, using asphaltic materials. In addition to The Asphalt Institute, the following companies will also exhibit: Jas. B. Barry Sons Co., Standard Oil Co. of Indiana, Standard Oil Co. of Louisiana, Standard Oil Co. of New Jersey, Standard Oil Co. of New York, Texas Co., Hasting Pavement Co., Barber Asphalt Co., and Shell Petroleum Corp. The Institute will be represented by J. E. Pennybacker, Managing Director; Bernard E. Gray, Highway Engr.; Prevost Hubbard, Chemical Engr.; V. A. Poulson, Asst. Highway Engr.; and F. C. Field, Chemist.

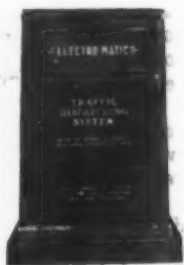
**Athey Truss Wheel Co.**, Chicago, Ill., will show an 11-14-yard hopper-type rear dump trailer at Booth A-66 in Building A. Other Athey truss wheel equipment on exhibition will include the new improved Athey three-way 15-ton capacity and 10-ton capacity trailers arranged for operation with elevating graders.



*A Leaning Wheel Grader with Front Scarifier*

**Austin-Western Road Machinery Co.**, Chicago, Ill., will have on exhibition an Austin 6-cylinder 12½-25 dual drive motor grader equipped with front scarifier, pneumatic tires, electric starting and lighting system and special blade for oil mix work; a Model 20 dual drive motor grader with leaning front wheels, electric lighting system and Super-Service blade for gravel road maintenance; a 10-ton Autocrat roller with pneumatic scarifier, electric starter, power steering and wheel sprinkling system; a 7-ton Cadet roller with pneumatic scarifier; a Monmouth Senior leaning wheel grader with front scarifier and back sloper; a Contractor's Special elevating grader with engine driven carrier; a Western Earthmover elevating grader with engine driven carrier; a 5-yard direct hitch crawler dump wagon with automatic spring wind-up and a tandem drive motor maintainer with front scarifier. This exhibit will occupy space A-43 and A-25.

**Automatic Signal Corp.**, New Haven, Conn., will show an Electro-Matic full vehicle actuated traffic control, a Traff-O-Matic semi-vehicle actuated traffic control, the Electro-Matic pedestrian crossing system and the Electro-Matic traffic counting equipment. The booth is A-69 and R. B. Dodds, Jr., Traffic Engr., will be in charge.



*Housing for the Control of the Electro-Matic Traffic Dispatching System*

**Baker Manufacturing Co.**, Springfield, Ill., will exhibit in Space A-33-40 the leading items of its line of tractor equipment, including the new Timken-equipped Baker-Maney scrapers, Models DR, 1½-cubic yard, and KR, 1-cubic yard capacity, hydraulic bulldozers and backfillers, a one-man automatic road maintainer as well as several sizes of Baker rotary scrapers. J. G. Miller, Vice Pres. & Sales Mgr., will be in charge with E. E. Staley, W. C. Staley, L. A. Ginzler and other officers and sales representatives of the company in attendance.

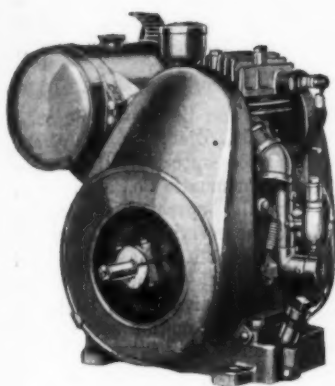
**Barber Asphalt Co.**, Philadelphia, Pa., will be located with the Asphalt Institute group in Space A-125 in the North Exhibition Building. A model of a modern city of the future will be on display, as well as cuts of old Trinidad Lake and Bermudez Lake asphalt pavements which have been in use for many years, cross sections of Trinidad and Bermudez sheet asphalt and asphaltic concrete pavements, samples of crude asphalts, refined asphalts, asphalt cements and a section of concrete highway which was repaired with Genaseo crack filler. Representatives of the company will include C. W. Bayliss, Vice Pres.; J. E. Morris, Mgr., Street & Road Dept.; Ralph C. Heath, Dist. Mgr., St. Louis territory; H. J. Wells, Dist. Mgr., Chicago territory; B. B. Alexander, Dist. Mgr., Kansas City territory; W. F. Hartzell, Adv. Mgr., and E. D. Lockwood, Sales Rep.

**Barber-Greene Co.**, Aurora, Ill., will exhibit the new B-G 62 Super loader with Kron scale weigh hopper. This new loader is a crawler-mounted, self-feeding, one-man operated machine with a capacity of 62 cubic feet per minute and is equipped with a new dial-scale weigh hopper. The weighing unit built into this hopper is an American Kron scale, the dial of which is graduated into 2-pound units and is provided with two markers which may be set to indicate the desired reading. This hopper will weigh batches up to 3,600 pounds, not to exceed 32 cubic feet in volume. The machine has the standard features of any B-G loader and in addition to the standard overload release sprocket for the protection of the machine against strains due to an overload on the bucket line, an overload release sprocket on the crawler drive to protect the machinery there.

**Barrett Co.**, New York, N. Y., will feature a large Tarvia distributor truck, pre-mixed tar macadam Tarvia-lithic, samples of the various sized mixtures and sections of actual pavements, and a new concrete joint and crack filler called Plastic Tarvia-XC. Tarvia executives and engineers will be in attendance at Booth No. B-5.

**Black & Decker Manufacturing Co.**, Towson, Md., will exhibit the Drive-On Loadometer, which is a portable weighing device for determining the gross axle and wheel load weight of motor trucks on the highway; the Test Loadometer, an instrument designed for measuring the compressive strength of concrete pipe and other concrete products; the Black & Decker valve resurfacer and other units of the electric tool line which are especially adapted to the maintenance of highway equipment. This exhibit will be located at Booth A-92 and E. E. Powell and H. L. Prince will be in attendance.

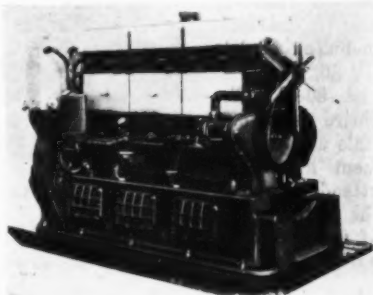
**Blaw-Knox Co.**, Pittsburgh, Pa., will have on exhibition the following equipment: a portable bulk cement plant for road contractors, 110-barrel capacity and equipped with 1,000-pound Blaw-Knox cement batcher of the latest design; the Cementank, a new development for the transportation of bulk cement; the 7-yard Blaw-Knox wagon grader equipped with crawler tracks, which digs, hauls, transports, dumps and spreads dirt and can also be used as a bulldozer; weighing batchers for weighing three types of aggregates to be used where the coarse aggregate is divided into two sizes; the agitator truck body mounted on a motor truck equipped with revolving blades geared to the truck transmission to keep the concrete in constant agitation while in transit; the Ord finishing machine and a 51-ton weighing batcherplant equipped with a double weighing batcher. There will also be on display the various types of Blaw-Knox clamshell and dragline buckets, the new 8-inch base road forms as well as the complete line of 6-inch base road forms and the various types and sizes of street and sidewalk forms.



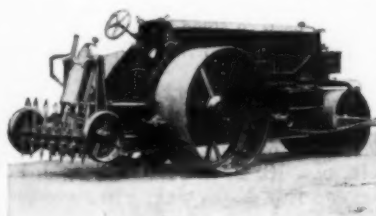
*A Briggs & Stratton Model M Gasoline Motor*

**Brookville Locomotive Co.**, Brookville, Pa., is exhibiting at Booth A-46, showing a 36-inch gage 8-ton Model BMD-8 gasoline locomotive. P. B. Eisenman and W. E. Briggs will attend the exhibit.

**Buda Co.**, Harvey, Ill., has announced that two models of diesel engines and five models of gasoline engines will be shown. A 120-horsepower diesel power unit, a  $6\frac{1}{2} \times 8\frac{3}{4}$  full diesel engine of the 4-stroke cycle, compressorless type, operating at speeds of 400 to 1,000 rpm will be shown and also a 180-horsepower diesel engine. The former is the style adapted to such uses as generator sets, rock crushers, saw mills, dredges, compressors and similar equipment while the latter is widely used with excavators. Models BA-6, JH-4, FR, H-199 and H-298 gasoline engines will also be exhibited. R. K. Mangan, Sales Mgr. of the Industrial Division, will be in charge and other Buda representatives who will be present are: L. M. Viles, Pres.; H. M. Sloan, Gen. Sales Mgr.; L. H. Earle, Mgr., New York Office; L. F. Shoemaker and A. F. Ochtman, Sales Engrs.



*A Buda 6-Cylinder, 180-hp Diesel*

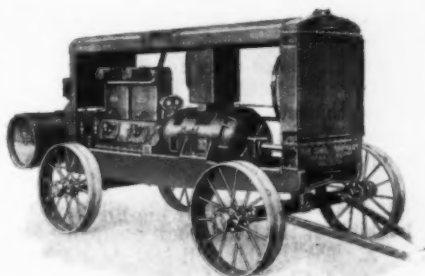


*VM-41 Buffalo-Springfield Roller*

ton motor tandem. Representatives of the company in attendance will be C. J. Foster, Gen. Mgr.; J. F. Richardson, Sales Mgr.; A. W. Aitken, Chief Engr.; P. S. Foster, Adv. Mgr.; H. D. Dunkel, Traffic Mgr.; W. J. Hazeltine, Sales Engr.; W. H. McClenen and Wilbur Heathman, Special Reps.; L. F. Bryant, E. C. Touhey, A. Peek and George P. White, Branch Mgrs., from Cambridge, Mass., New York, Buffalo and Philadelphia, respectively.

**Briggs & Stratton Corp.**, Milwaukee, Wis., will show 4-cycle air-cooled gasoline motors at Booth B-63. The sales representatives who will attend are R. W. Randall, A. H. Quade, C. A. Walker, and Edward V. Oehler, Service Mgr.

**Broderick & Bascom Rope Co.**, St. Louis, Mo., is to show its wire rope and highway guard rail at Booth B-87.



*The New WB-220 Air Compressor*

**Buhl Co.**, Chicago, Ill., will have on display in Booth B-3 Types FJ-36, WB-110 and WB-220 Buhl portable air compressors. The latter is a new addition to the Buhl line, among the features of which are the motor attached to the compressor by means of a bell housing and special motor frame, a Louis Allis motor built into a special frame and a large water cooling system for continuous heavy duty service. These units can be furnished in 110, 220 and 330-cubic foot displacements. Those present will be William I. Buhl, Pres.; George R. Stege, Jr., Secy.; F. C. Marshall, Chief Engr., and George C. Theall, Eastern Mgr.

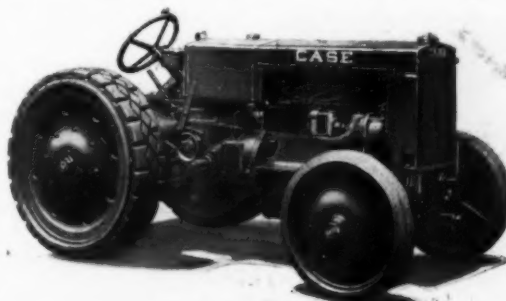
**Butler Bin Co.**, Waukesha, Wis., will display its latest type of contractor's portable bins equipped with a new and improved weighing hopper at Booth AR-16. There will also be shown a road contractor's portable bulk cement handling plant and motion pictures taken in the field as well as several small models of aggregate proportioning equipment. The exhibit will be in charge of M. R. Butler, A. R. Morton, C. E. Riblet and M. Kelley.

**Burch Corp.**, Crestline, Ohio, plans to exhibit a Burch spreader, models of the Burch car unloader and the Ross snow plow, a recent addition to its line. E. C. Bishop will be in charge, with Lester T. Ross, Chief Engr., Snow Plow Div.; and J. L. Morrow, Gen. Mgr., also in attendance.

**The Byers Excavator Co.**, Ravenna, Ohio, will have on exhibition at Booth AR-14, a Byers Model 40 and Model 50 excavator and a Model 40 trailer. H. C. Beekwith, Pres. & Gen. Mgr.; P. T. Redfern, Sales Mgr.; L. T. McGuire, Asst. Sales Mgr., and C. H. Lotte, Chief Engr., as well as Byers distributors will be in attendance.

**The Philip Carey Co.**, Cincinnati, Ohio, will show Elastite expansion joint, Elastite asphalt plank and Elastite rail filler in Booth A-80. C. V. R. Fullenwider, Mgr., Elastite Products Div., assisted by members of the Sales and Engineering Depts., will be in attendance at the exhibit.

**J. I. Case Co.**, Racine, Wis., will exhibit in Booth B-44 a Model CI industrial tractor with heavy cast wheels and



*A Model CI Industrial Tractor*

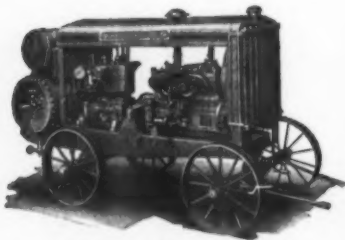


solid rubber tires, a Model CI industrial tractor with cast wheels and pneumatic tires and also with extension pneumatic tires on the rear wheels, a Model LI tractor with heavy cast wheels, wedge rings for easy tire removal and solid rubber tires and a Model CI tractor fitted with Trackson crawler attachment. G. W. Iverson, Sales Mgr., Industrial Div.; and Tolmar Nelson, Engineering Dept., will be in attendance.

**Caterpillar Tractor Co.**, Peoria, Ill., will have the largest individual exhibit at the Road Show occupying Space A-26 in Building A. The exhibit will include a Fifteen motor patrol, a Fifteen trailer patrol, a Twenty planer, a Thirty leaning wheel grader, a Sixty leaning wheel grader, Sixty elevating grader mounting a Caterpillar Twenty engine, a Super Special grader, a Ten grader, a Caterpillar Sixty with snow plow, a Thirty, Twenty, Fifteen and Ten Caterpillar, a high clearance Caterpillar Ten, a Caterpillar Fifteen, with side seat and a Caterpillar Twenty with side seat. In addition, the Caterpillar Tractor Co., is holding an exposition at Peoria from January 12 to 24 for 50 manufacturers building new equipment to team with Caterpillar power. About 150 new models will be exhibited. The manufacturers who are exhibiting with Caterpillar at Peoria include: All Steel Products Mfg. Co., Inc.; American Tractor Equipment Co.; Anderson Machine Works, Inc.; The Ann Arbor Machine Co.; Paul Arbon Co.; Athey Truss Wheel Co.; Babcock Implement Co.; The Baker Manufacturing Co.; John Bean Mfg. Co.; F. S. Bishop; Blount Plow Works; Burnham Mfg. Co.; Champion Corp.; Davy Compressor Co., Inc.; Day Pulverizer Co.; Dempster Mill Mfg. Co.; Detroit Harvester Co.; Dorsey Brothers; The Euclid Crane & Hoist Co.; Eureka Mower Co.; General Implement Co.; The Hardie Manufacturing Co.; Highway Trailer Co.; Hi-Way Service Corp.; Killefer Manufacturing Corp.; LaPlant-Choate Mfg. Co., Inc.; The Letz Manufacturing Co.; Light Draft Harrow Co.; Luther Manufacturing Co., Inc.; Maine Steel Products Co.; Master Equipment Co.; The Miami Trailer-Scraper Co.; Motor Improvements, Inc.; The New Idea Spreader Co.; Owensboro Ditcher & Grader Co.; Peoria Drill & Seeder Co.; Pioneer Gravel Equipment Mfg. Co.; Prater Pulverizer Co.; Rawls Manufacturing Co.; Reed-Prentice Corp.; Rex-Watson Corp.; Rock Island Plow Co.; The Rotary Snow Plow Co.; The Ross Cutter & Silo Co.; Schramm, Inc.; Shaw Excavator & Tools Co.; Simplex Fuel-Tank Filler Co.; Smith Trailer Corp.; Towers & Sullivan Mfg. Co.; W-K-M Co., Inc.; Wausau Iron Works; Willamette Ersted Co., and G. H. Williams Co.

**Central Iron & Steel Co.**, Harrisburg, Pa., plans to exhibit its Knobby non-skid floor plates and traffic treads for use in road construction and will have exhibits of the various plates it makes and their application. Mr. Irons, President of the company, and his technical road staff, will be in attendance.

**Chicago Pneumatic Tool Co.**, New York, will occupy Booth B-44-A where it will exhibit a CP portable gasoline engine driven air compressor, a CP 120-foot Duplex single stage, direct connected, motor driven air compressor mounted on skids, as well as rock drills, pavement breakers, sheeting drivers, backfill tampers, clay diggers, woodboring machines, riveting hammers, chipping hammers, calking hammers,



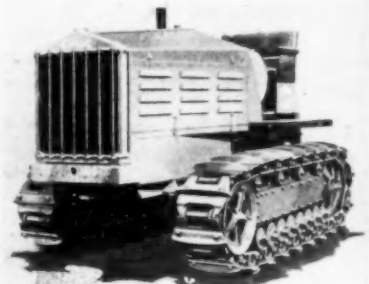
A CP Portable Compressor  
drivers, backfill tampers, clay diggers, woodboring machines, riveting hammers, chipping hammers, calking hammers,

grinders, concrete surfacers, electric hammer drills and a CP Quimby sump pump. Representatives in attendance will include J. F. Huvane, J. W. Zinkgraf, G. J. Lynch, and T. McElligott.

**Cleveland Pneumatic Tool Co.**, and its associated company the **Cleveland Rock Drill Co.**, Cleveland, Ohio, are exhibiting at Booth B-102 and B-28 respectively. The automotive division of the Cleveland Pneumatic Co., F. H. Burr, Director, will show an electrically operated display of Cleco Gruss air springs and a demonstrating display of the new Cleco multi-power booster brakes. The Rock Drill exhibit will include a working model of the H-7 sinker with opening through the cylinder valve chest, backhead and chuck housing and operating slow motion so that full action of the mechanism may be observed. Those in attendance will be George H. Hall, Sales Mgr.; Edward L. Oldham, Adv. Mgr.; D. J. Hafford, Field Supt.; and C. H. Brett, St. Louis District Mgr.

#### Cleveland Tractor Co.

Cleveland, Ohio will have on display the complete line of Cletrac crawler tractors, including Models 15, 20, 40-30, 40 and 80-60. The entire list of officials and department heads will attend, as well as the entire force of field salesmen. This exhibit will be located in the Exhibition Hall in adjoining Spaces 24 and 44.



An 80-60 Cletrac

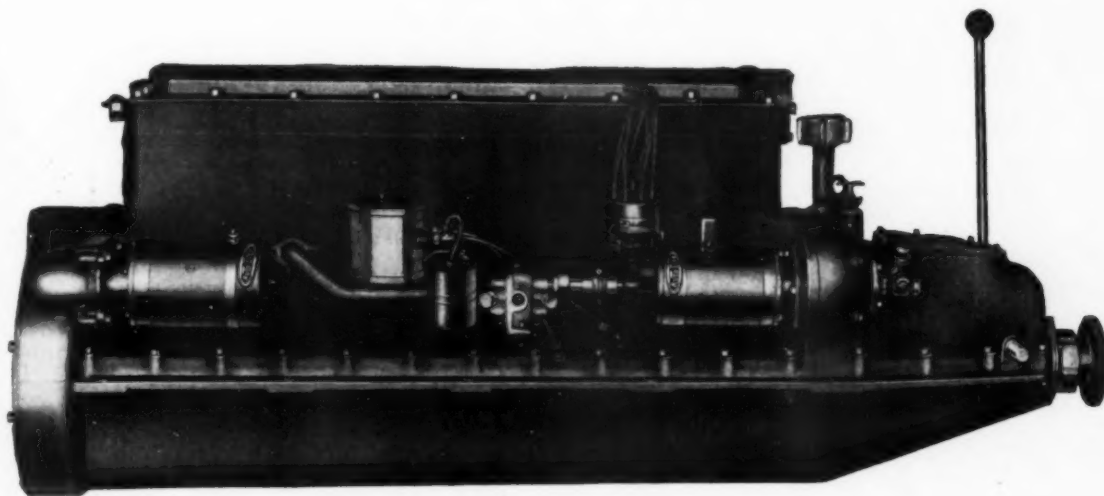
**Clinton Motors Corp.**, Reading, Pa., will exhibit its heavy Clinton track on which is mounted a 3-yard Clinton concrete conveyor-conditioner and a Wood Hi-Lift hoist. This conveyor body will incorporate the latest developments, including the enlarged discharge door which makes it possible to discharge any slump concrete required. The space number is B-13 and the exhibit will be in charge of George M. Bunn, Sales Mgr., assisted by Roger Vollmer, Salesman. A. E. Hoffman, Gen. Mgr., will also be in attendance at the booth.

**Thos. E. Collins & Co.**, St. Louis, Mo., will have on display at Booth A-110 its signals and road signs for road repair and maintenance work. These signs, Redteco and Yelteco, are made of Fabrikoid. There will also be exhibited heavy cotton fabric used in some sections on gravel roads. Tom Collins and Forrest Sloan will be in attendance.

**The Columbia Products Co.**, Barberton, Ohio, will devote its space A-90 to a display of 3C calcium chloride and literature describing its use. C. B. R. Fitz-William, J. F. Doekum, S. S. Warren and Ray A. Giddings will represent the company.

**Concrete Surfacing Machinery Co.**, Cincinnati, Ohio, will exhibit a Berg Model A electric concrete surfacer and finisher, a portable air-driven surfacer, a channeling tool, the Berg cleaning tool, a carbo cylinder surfacer and the Hi-Way surfacer. This exhibit will be located at Booth A-89 and those in attendance will be M. Wetstein, Pres.; Robert McConnell, Alvin Dreifus, Frank E. Aurand, Jr., and Maurice Wolfson, Sales Engrs.

# AUTO-LITE INSURES DEPENDABLE NIAGARA IGNITION



**T**HE name "Niagara" suggests great and dependable power. In marine engines it is a name that stands for reliability, long life and high quality. Niagara marine engines are among the best known and most popular of their kind in the country.

The makers of Niagara engines insure a thoroughly efficient electrical system in keeping with their high standards of quality by equipping all engines with Auto-Lite starting, lighting and ignition systems.

Builders of tractors, trucks, fire engines, and all sorts of heavy duty engines, as well as more than half of all American automobiles, use Auto-Lite equipment for dependable operation under all conditions.

THE ELECTRIC AUTO - LITE COMPANY, TOLEDO, OHIO

# Auto-Lite

***Starting, Lighting & Ignition***

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.



A T &amp; B Road Torch

**Consolidated Iron-Steel Co.,** Cleveland, Ohio, will show its various styles of T & B road torches in Booth B-112, with L. S. Cawrse representing the company.

**Continental Motors Corp.,** Muskegon, Mich., will have on exhibition a deluxe H series engine of the removable sleeve, overhead valve, dry sump lub-

ricating type, a new small 6-cylinder power unit, Model P640, which is a  $3\frac{3}{8}$  x 4 6-cylinder engine developing 40 horsepower at 1,600 rpm, and the new M9 4-cylinder industrial engine,  $4\frac{1}{8}$  x  $4\frac{1}{4}$ , developing 31 horsepower at 1,200 rpm. This engine is designed for heavy duty industrial service and is equipped with center outlet exhaust, has provision for magneto or distributor ignition and a mechanically operated governor. Stuart Nixon, Sales Engr., will be in charge of this exhibit, which will be located in Space B-60, and the following will also be present: W. R. Angell, Pres.; L. J. Kanitz, Gen. Sales Mgr.; L. P. Kalb, Chief Engr.; S. F. Evelyn, Chief Industrial Engr.; O. R. Baird, Mgr., Automotive Sales; A. R. Smith, Mgr., Industrial Sales; Ray Long, W. N. Fitzgerald, Jr., R. J. Middleton, J. A. Kraus, M. H. Schachner, Sales Engrs., and H. D. Stevens, West Coast Sales Rep.

**Curtis Pneumatic Machinery Co.,** St. Louis, Mo., will exhibit for the first time its new line of Curtis Model C high speed, Timken roller bearing, carbon-free portable compressors. This line is made in four sizes and two styles, the 40 and 60-cubic foot capacities being two-wheeled highway trailer type portables and the 80 and 120-cubic foot capacities, four-wheel truck trailer types. There will also be exhibited a small self-contained gasoline engine driven air compressor outfit, Curtis hydraulic washers for washing highway and contractors' trucks, an electric driven compressor outfit particularly adapted for service and repair shops and a working model of a Curtis oil-locked hydraulic truck and bus lift.

**Cyclone Fence Co.,** Waukegan, Ill., will exhibit Cyclone woven wire road guards at Booth No. A-72, and will be represented by H. G. Chapman, L. E. King, E. Kyndberg and W. P. Shepherd.

**D-A Lubricant Co., Inc.,** Indianapolis, Ind., will have on exhibition at Space A-120, three sizes of D-A drums of 15, 35 and 58 gallons capacity. Among its representatives will be Frank L. Binford, Pres.; Louis C. Slicer, Secy.; L. S. Frahm, L. E. Robinson and J. D. Hughes of the Sales Dept.

**Davey Compressor Co.,** Kent, Ohio, will display a 142-cubic foot Davey compressor mounted on a Caterpillar Twenty tractor as well as three other Davey compressors, one a 142-cubic foot trailer mounted compressor, a 119-cubic foot trailer unit powered by a Ford model A engine and a Davey unit mounted on a 1930 Fordson tractor. W. W. Warner, Chief Engr., will be in charge of the exhibit and will be assisted by M. L. Gibson, R. N. Jensen and W. E. Murphy.

**Diamond Iron Works, Inc.,** Minneapolis, Minn., will exhibit in Booth AR-12-A a portable crushing and screening plant and a roller bearing crusher. Its representatives will include J. J. McKay, Vice Pres.; C. T. Johnson and W. R. Furr, Jr. of its Sales Department.

**Dodge Brothers Co.,** Detroit, Mich., will show the new Dodge standard and heavy duty truck in Building B, Spaces 13 and 15. On display will be chassis equipped with dump bodies, road scrapers, snow plows and various other accessory equipment applicable to road work. In the Motor Freight Exposition there will be a 3-ton 195-inch drop frame chassis.

**Dow Chemical Co.,** Midland, Michigan, will display Dow-flake calcium chloride in Booth A-75 and will be represented by D. Williams, H. Knowles, T. E. Williams, Vern Moulton, G. F. Metcalf, W. M. MacGillivray and J. R. Anderson of Midland and F. A. Koch of New York City.

**Eiseman Magneto Corp.,** New York City will occupy Space B-84 where it will exhibit high tension magnetos for one, two, four and six-cylinder engines as well as various size flywheel type magnetos. The company will be represented by T. E. Kennedy, Gen. Sales Mgr.; O. S. Stanley, Mgr., Chicago Branch; and I. W. Edwards, Mgr., Detroit Branch.

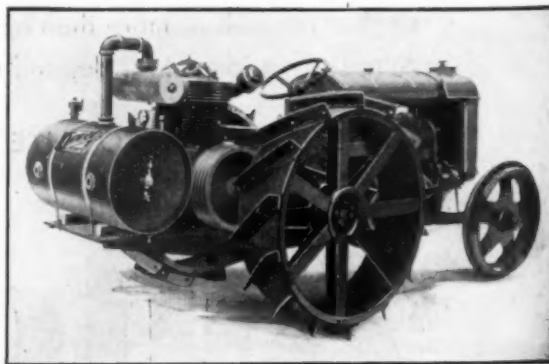


The Dreadnaught Dump Body Crawler Trailer

**Electric Wheel Co.,** Quincy, Ill., will have on display in Booth 55-68 the various styles of Electric steel wheels, EWC roller bearings, steel axles, Dreadnaught crawler treads, bottom-dump crawler trailers, and 3-way dump crawler trailers. F. F. Alexander, Sales Mgr., will be in charge.

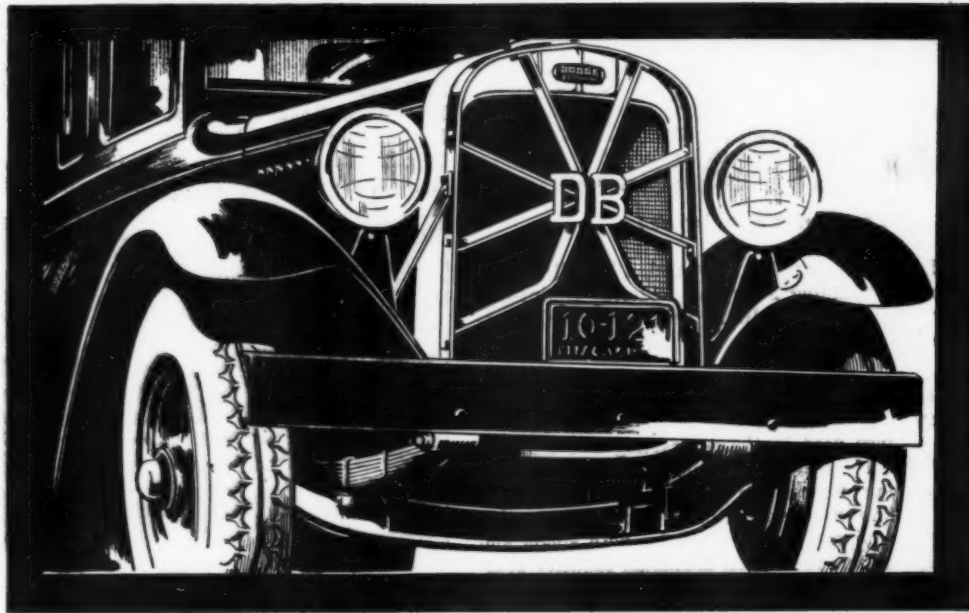
**E. D. Etnyre & Co., Inc.,** Oregon, Ill., will exhibit a Model F asphalt distributor mounted on a Model C-87 Hug chassis at Booth B-31-A. The representatives in attendance will include E. D. Etnyre; R. D. Etnyre; G. M. Etnyre; George E. Pearson and J. L. Long.

**The Euclid Crane & Hoist Co.,** Cleveland, Ohio, in Booth A-49 will show a new Euclid track-wheel hydraulic bottom dump wagon, a Euclid track-wheel gravity dump wagon, a Euclid hydraulic rotary scraper, a Euclid hydraulic bulldozer on a Caterpillar Sixty tractor and a new Euclid



A Davey Compressor Mounted on a Fordson Tractor





# SEE THE COMPLETE HEAVY DUTY LINE

For the heavy duty needs of Contractors, there is now an unusually complete line of Dodge Trucks—ranging in payload capacities from 2950 to 11,175 pounds. They are heavy duty trucks through and through . . . with exceptionally powerful, dependable, economical engines . . .

truck-type clutches  
. . . sturdy 4-speed  
transmissions . . .

deep, rugged frames . . . drive shafts, springs, internal hydraulic 4-wheel brakes and full-floating rear axles (including double reduction) that are brutes for heavy duty work and look the part.

*Inspect, drive and compare these modern heavy duty Dodge Trucks. You will say that they are "all-truck"—*

*that they look able, perform ably and are unusual values on any basis of comparison.*

THE COMPLETE LINE OF DODGE TRUCKS RANGES IN  
PAYLOAD CAPACITIES FROM 1,200 TO 11,175 POUNDS—  
PRICED, CHASSIS F. O. B.  
DETROIT, FROM \$435  
TO \$2695, INCLUDING  
1½-TON CHASSIS AT

**\$595**

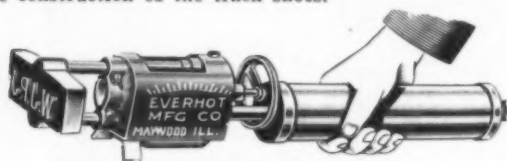
**DEPENDABLE**

SEE THEM AT  
THE ROAD SHOW--  
SPACES 13 AND 15

# DODGE HEAVY DUTY TRUCKS

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

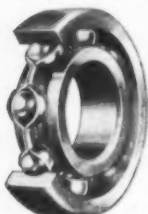
scientifically designed track-wheel track or belt, showing the construction of the track shoes.



*The Everhot Branding Iron*

**Everhot Manufacturing Co.**, Maywood, Ill., will exhibit Everhot torches, branding irons and soldering equipment. Its booth will be B-10 and Edward Leight and A. C. Flot-how will be in attendance.

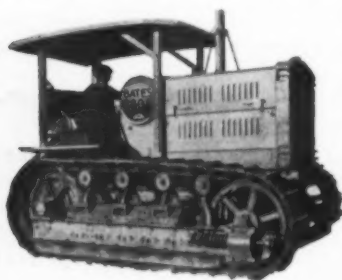
**Fafnir Bearing Co.**, New Britain, Conn., will exhibit a complete line of the various types and sizes of ball bearings used in the contracting and highway field, including typical bearings such as are used in the products of various well known manufacturers of construction equipment. This includes both single and double row types, maximum capacity bearings which readily absorb high loads, both radial and thrust. This exhibit will be located in Booth B-75, and C. F. Stanley, Mgr., Industrial Sales; C. W. Kramlich, Sales Engr., and H. R. Reynolds, Chief Engr., will be present.



*A Fafnir Bearing*

**Federal Motor Truck Co.**, Detroit, Mich., will display in Booth B-19 a Model D, 1½-ton chassis with 1½-yard dump body, a Model A6 2-ton chassis with 2-yard dump body, a Model T-10B 2½-3-ton chassis with 3-yard dump body and a Model 4C6A, 4-5-ton chassis. The representatives in attendance will include F. D. Engle; J. M. Dunwoodie; Charles L. Granger; and E. W. Winnans, Factory, Body and Equipment Engr.

**Flintkote Roads, Inc.**, New York City, in Booth B-105 will exhibit a hand pressure sprayer, several drums of Colas asphalt emulsion and pouring pots as well as photographs featuring airport construction. The representatives in attendance include Colonel H. L. Bowlby, Gen. Mgr.; V. L. Ostrander, Division Engr.; G. N. Hoffman, Engr.; J. W. Pennycook, Engr.; F. J. Murray and L. M. Stanhope.

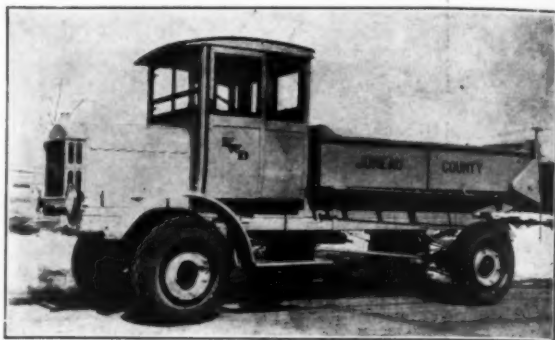


*A Bates 80 Tractor*

straight wheel grader, a 35-8 leaning wheel grader and a No. 2 Whippet. The sales representatives in attendance will include W. C. Davis, Pres.; H. H. Bates, Vice Pres. and Sales Mgr.; W. O. Bates, Jr., Promotion Mgr.; F. P. Callaghan, Vice Pres.; W. A. Barr, Vice Pres., and J. P. O'Hara, Asst. Sales Mgr.

**Four Wheel Drive Auto Co.**, Clintonville, Wis., will have on exhibition in Booth B-33 an FWD CU6 model of 3½-

ton capacity body and hoist mounted and a chassis of the FWD M7 of 7½-ton capacity. Members of the company who will be present include W. A. Olen, Pres. & Gen. Mgr.; R. H. Schmidt, Gen. Sales Mgr.; S. H. Sanford, Asst. Sales Mgr.; C. S. Thomson, Export Sales Mgr.; D. C. Babcock, Mgr. of Branches; Col. Thompson Short, Mgr., Kansas City Branch; R. W. Pachaly, Mgr., Chicago Branch; W. M. Hanson, Adv. Mgr., and H. B. Dodge, Chief Engr.

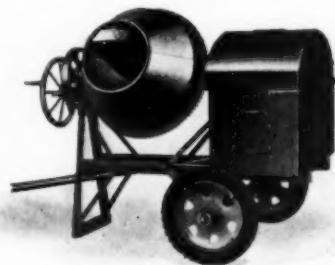


*The FWD Model CU6 of 3½-Ton Capacity*

**The Galion Allsteel Body Co.**, Galion, Ohio, at Booth B-14 will exhibit a line of hydraulic hoist and dump bodies. The organization will be represented by G. L. Stiefel, Pres.; B. J. Heiser, Sales Mgr.; Russell E. Myers, Sales Rep., and Fred Bisantz, Supt.

**Galion Iron Works & Mfg. Co.**, Galion, Ohio, will show a heavy duty No. 12 leaning wheel grader, a No. 70 E-Z lift leaning wheel grader, McCormick-Deering motor patrol grader, complete with 10-20 International industrial tractor, equipped with pneumatic tires, a United motor grader equipped with Sure-Trac crawlers, No. 8 multiple blade maintainer, rock crusher, a 10-ton Master roller, a 5-ton International roller and a stone spreader. The booth will be located in Space A-18 and A-13, and J. S. Boyd, Vice Pres., and H. G. Hulse and C. F. Boyd will be in attendance.

**General Wheelbarrow Co.**, Cleveland, Ohio, will have its exhibit in Booth B-116 where there will be on display the line of Empire grader blades in various lengths, showing the new state standard punching. Those in attendance will be W. A. Gordon, Sales Mgr.; J. M. Rorimer, Vice Pres.; and J. W. Cole, Southern Sales Rep.



*A Gilson Concrete Mixer*

**Gilson Bros. Co.**, Fredonia, Wis., will exhibit in Booth A-37 a trailer concrete mixer. J. P. Gilson, Pres., will be in charge.

**W. S. Godwin Co.**, Baltimore, Md., will show in Booth A-79 its steel paving guards in connection with full sized sections of roads, streets, railroad crossings, street railway

# Every year for many years will be a big year for Tarvia "Re-Tread"

The economy and speed of Tarvia "Re-Tread" construction make a stronger appeal every year to road officials who must make a little money do the work of a lot.

No other type of pavement can be built so quickly and cheaply, and with so little expensive equipment. First cost and subsequent maintenance are so low that there is no longer any reason for dusty, rough or dangerous surfaces, even on light traffic roads. Tarvia "Re-Tread" provides smooth, skid-safe, easy-riding pavement—pavement that will withstand a surprising amount of traffic.

A thorough understanding of Tarvia "Re-Tread" will insure its inclusion in your plans for 1931. The Tarvia field man will give you the details. 'Phone, wire or write our nearest office.

## Tarvia "RE-TREAD"

Trade Mark Reg. U. S. Pat. Off.

The *Barrett* Company

New York  
St. Louis  
Detroit  
Buffalo  
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Lebanon  
Minneapolis  
Cleveland  
Columbus

Philadelphia  
Youngstown  
Hartford  
Toledo  
Boston

Birmingham  
Milwaukee  
Cincinnati  
Rochester  
Bethlehem  
Syracuse

*In Canada:*

THE BARRETT COMPANY, Limited

Montreal

Toronto

Winnipeg

Vancouver





*A Godwin Steel Paving Guard*

etc. The representatives are W. S. Godwin, Pres., and J. L. Perkins.

**Good Roads Machinery Co., Inc.**, Kennett Square, Pa., will exhibit a complete model rock crushing plant, fully equipped with the primary and reduction type crushers, elevators, screens, bin, and all transmission equipment complete as well as models of various other pieces of Good Roads equipment. This model of the rock crushing plant is built on one-quarter scale and will be in operation so that stone may be put through the crushers and prepared by this plant as it is prepared in the full-sized plants. Earle S. Philips, Vice Pres. & Gen. Mgr.; R. S. Tucker, Asst. Gen. Mgr.; W. D. Polk, Gen. Sales Engr.; E. C. Brown, Sales Engr.; J. W. Kitts, Adv. Mgr.; C. G. A. Smith, Jr., Chief Engr., and M. A. King, Mgr., Chicago office, will represent the company at its exhibit which will be located in Booth A-9.



*The Good Roads Exhibit*

**Goroco Mechanical Spreader Co.**, Philadelphia, Pa., will exhibit in Booth A-71 a new type machine for spreading sand and chips for covering oiled and water bound surfaces and icy pavements. R. E. Eggleston will be in charge of the exhibit, assisted by A. I. Dean and H. M. Bechtel, Sales Mgr.

**George Haiss Mfg. Co., Inc.**, New York, N. Y., will exhibit in Booth AR-9 in the Arena a Haiss excavator, a clamshell bucket and moving pictures showing Haiss products in the field. W. H. Bosworth will be in charge.

**Harley-Davidson Motor Co.**, Milwaukee, Wis., will exhibit in Booth B-137 a Harley-Davidson road marker and spraying machine, four 2½ to 3-horsepower Harley-Davidson gasoline industrial power units and a road patrol motorcycle. The company will be represented by Arthur Davidson, John R. Thonger, George Nortmann and G. F. Smith.

**Hastings Pavement Co.**, New York City, at Booth A-125 will exhibit its compressed asphalt paving and flooring

paving, concrete curbs, etc., as well as rustless steel facing for curbs which eliminate the more or less continuous painting of curbs around filling stations,

blocks, model pavements of asphalt block non-skid construction, asphalt blocks laid with asphalt joints and asphalt blocks laid on a bituminous cushion on plank decking as well as samples of asphalt blocks and tiles. A motion picture showing the method of manufacture and installation of asphalt block pavements will be shown. The company will be represented by P. L. Thompson, Sales Mgr.; T. J. McNally, Asst. Sales Mgr.; and A. E. Cohen, Technical Advisor.

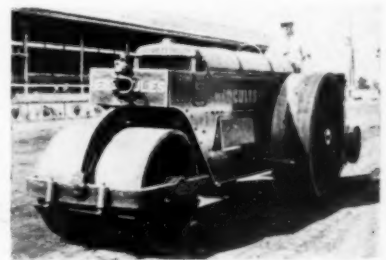
**Hayward Co.**, New York City, will exhibit at Booth AR-20-A its models and photographs of its Class E rehandling buckets, Class K digging buckets, standard and multipower orange peel buckets and dragline buckets in charge of E. J. Robeck and H. S. Atkinson.

**Headley Emulsified Products Co.**, Philadelphia, Pa., will exhibit literature and photographs in Booth B-121.

**Heil Co.**, Milwaukee, Wis., will have on exhibition at Booth B-15 a new Model 5-26 Hi-Lift unit designed for use with wet mix concrete bodies. A Model 51 2½-yard capacity with removable sides mounted with a No.-3 Heil twin-cylinder hydraulic hoist, a heavy duty Heil dumping unit, consisting of a 3-yard Model 11 Heil body and No. 4 Heil twin-cylinder hydraulic hoist and will show for the first time, the new Heil light duty WB unit. Heil branch managers and Milwaukee factory executives will be in attendance at the Heil exhibit throughout the Show week.

**Heltzel Steel Form & Iron Co.**, Warren, Ohio, will display in Booth AR-12 its complete line of concrete road building equipment, consisting of a 3-compartment portable storage bin equipped with a 3-compartment weighing batcher and an automatic springless dial scale; a complete line of steel forms for the construction of concrete roads, city streets, curbs, gutters and sidewalks; the latest improved flexible joint machine, and numerous small tools such as aluminum jointing tools, straight-edges, floats, etc. Those representing the company will be J. N. Heltzel, Pres. and Treas.; J. Wm. Heltzel, Asst. Gen. Mgr.; B. M. Clark, Sales Mgr.; W. A. Fliek, Traffic Mgr.; O. W. Davis and T. M. Bentley, Field Representatives.

**Hercules Co.**, Marion, O., will show the new line of Hercules 3-wheel gasoline road rollers, Models 60, 80, 100, 120 and 150, in Booth B-51. G. V. R. Mulligan, Mgr., Road Roller Sales, will be in charge.



*A Hercules 3-Wheel Roller*

**Hercules Motors Corp.**, Canton, Ohio, will exhibit a representative group of models, including the 4 and 6-cylinder engines and power units designed especially for use on specialized road building machinery, as well as similar models designed for commercial vehicle application. Of particular interest is the Model HXC 6-cylinder 5¼ x 6-inch industrial power unit shown as a complete open type power unit including radiator, all accessories and clutch power take-off. Another model is the Hercules HXD, 5½ x 6-inch, which is typical of the larger series of heavy



## faster, stronger CONCRETE winter or summer

Building contractors have learned that concrete, cured by Calcium Chloride in the mix, attains high early strength and permits much earlier release of forms.

Also that Calcium Chloride sufficiently accelerates the setting action of the mix to prevent frost damage. It is the only curing method that will make up for strength loss due to lower temperatures. This loss may amount to 50 pounds per square inch for each degree lost during the curing period.

Building contractors are invited to write to to any of the three companies sponsoring this advertisement for latest information regarding this improved method of concrete curing.

# CALCIUM CHLORIDE

Send this coupon to any one of these Calcium Chloride Publicity Committee Members.

Dow Chemical Co.  
Midland, Mich.

Columbia Products Co.  
Barberton, Ohio

Solvay Sales Corp.  
61 Broadway, N.Y. City

Without obligation please send latest reports and data on Calcium Chloride concrete curing practice.

Name \_\_\_\_\_

Address \_\_\_\_\_

C&EM 1-31

duty 6-cylinder engines, with leg-type bell housing and center outlet exhaust. Other engines and power units exhibited will be the OO, L and TX 4-cylinder series and the YX and WX 6-cylinder series, as well as a complete line of parts. Hercules will occupy Space B-1, with Clyde Schuler in charge. Others in attendance will be Charles Balough, D. W. Latta, John Keplinger, Lon R. Smith, Charles P. Weekes, Walter Radtke, George Earles, A. B. Wehling, R. J. Seott, John Carnahan and G. C. Eldredge.

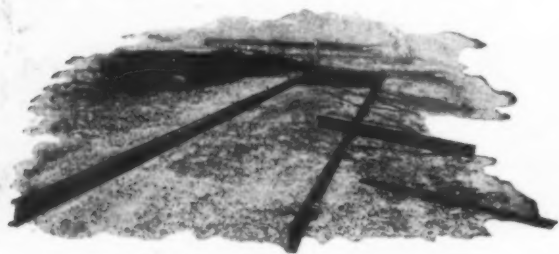
**Hercules Products, Inc.**, Evansville, Ind., will display in Booth B-86 Hercules 1½, 2, 2½, 3½ and 6-horsepower engines. In Booth B-11 the Hercules hydraulic, rotary and automatic type dump bodies will be exhibited. These engines and the rotary and hydraulic dump bodies are new products in the line manufactured by Hercules.



*The New Hercules Rotary Type Dump Body*

**Highway Service, Inc.**, New Bedford, Mass., will exhibit its line of Handy Sandy mechanical spreaders and will show for the first time a new method of mechanical distribution for the handling of the larger size stone for bituminous macadam, to be known as **Handy Rol-Roc**. This exhibit, which will be located in Booth 2, Exhibit Building B, will be in charge of Milton Burghardt, Pres. & Gen. Mgr., with A. N. Nickerson, Designing Engr., and W. G. Ramsden, Ohio. Rep., also present.

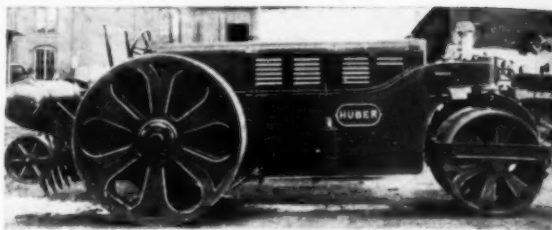
**Highway Trailer Co.**, Edgerton, Wis., will display in Space A-47-A a Highway trailer scraper, on the front end of which there will be mounted a motor so that the rakers on the inside of the scraper can be operated and the body raised and lowered.



*The Hotchkiss E. Z. Type Sidewalk Form*

**Hotchkiss Steel Products Co., Inc.**, Binghamton, N. Y., will exhibit in Space B-134 a new Hotchkiss road form, sidewalk, curb and gutter forms as well as other types of forms of interest to contractors. H. A. Speh, Pres.; M. G. Schneider, Vice Pres.; and E. T. Harrold, Sales Mgr., will be in charge of the exhibit.

**Huber Manufacturing Co.**, Marion, Ohio, will occupy Space A-32 and A-41, where there will be on display a 5-ton roller with scarifier and a 10-ton roller with scarifier



*The 10-Ton Huber Roller*

as well as the new 8-ton roller, shown for the first time, which is almost a duplicate of the other models in design and rounds out the Huber line of rollers. M. E. Miller, Sales Director, will have charge of the exhibit, with Glenn Porter in charge of the arrangement of the display. C. E. Gifford, Chief Engr., J. A. Cooper, Mgr., Indianapolis office, H. E. High and William J. Maloney, Salesmen, will also be present.

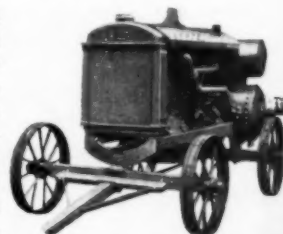
**Hug Co.**, Highland, Ill., in Arena Space B-35 will have a very complete exhibit of its specialized road building trucks and road building equipment including a Model 60 Road-builder, 85-D, 87-M, 67 and 97-6 Hug Roadbuilders, a Model 87-M with a special Trucktor unit, a light weight Model 23 dump truck and a new feature, the Hug rocker arm spring equalizer. A Hug sub-grade template and a Hug turntable will also be displayed.

**Hughes-Keenan Co.**, Mansfield, Ohio, will exhibit in Booth No. 18, Exhibition Building B, a 4-yard Iron Mule mounted on a McCormick-Deering Model 20 industrial tractor, a Roustabout crane and the latest model heavy duty hydraulic hoist dump body. The following representatives will be present: Arthur S. Hughes, W. E. Post, Herman W. Schaller, J. D. Corrigan, E. F. Murray and A. T. Reynolds.

**Humboldt Mfg. Co.**, Chicago, Ill., at Booth B-136 will show road material testing equipment such as cement molds, cement fineness shaker, cement consistency apparatus, specific gravity apparatus, setting time tester, testing sieves and screens, asphalt ductility machine, asphalt penetrometer, asphalt viscosimeter, melting point apparatus, shear test machine for asphaltic mixtures, grease consistometer and grease worker, as well as a Eureka testing outfit, designed by Prof. W. M. Dunagan of Iowa State College, for specific gravity tests on fine and coarse aggregate, free moisture or absorption, silt determination and analysis of the constituents of fresh concrete. The exhibit will be in charge of A. F. Arndt.

**Chas. Hvass & Co., Inc.**, New York, N. Y., will have on exhibition at Booth AR-19 a Hvass distributor mounted on a motor truck, a bituminous auxiliary tank trailer, a heavy duty transport trailer and a spreader attachment for dump trucks. Charles T. Hvass, Pres., and B. F. Priddy, Secy. & Treas., will be in attendance.

**Independent Pneumatic Tool Co.**, Chicago, Ill., will exhibit in Booth B-52 Thor air compressors, rock drills and contractors' tools. The 220-cubic foot capacity Thor air compressor will be shown, mounted on a heavy duty steel wheel trailer. The Thor clay digger will also be shown as well as the Thor Coehise rock drill. Those



*A Thor 220-Cubic Foot Air Compressor*

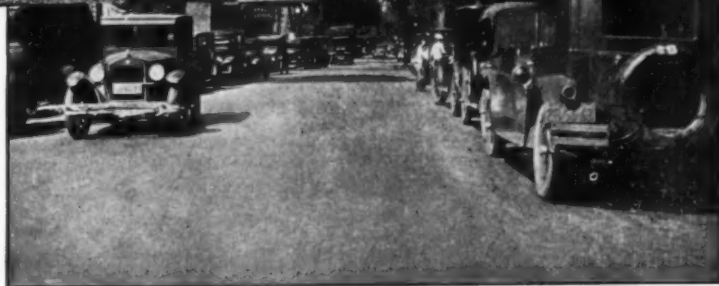


# Pave and Save with ASPHALT



Salvaging old concrete pavement in Gloversville, N. Y., by utilizing it as a base for a new asphalt surface.

Franklin Street, from Tupper Street to Allen Street, Buffalo, N. Y. Sheet asphalt surface on an asphaltic concrete or "black" base. The maintenance cost of this street has for sixteen years averaged only 0.012 per square yard per year.



The Asphalt Institute presents as a sound street construction program for 1931 the following basic considerations:

- 1 Surface treatment of outlying gravel and macadam streets to provide smooth, dustless surfaces and lower maintenance costs.
- 2 Utilization of the old brick, stone-block, cobble and concrete pavements on the more important streets as bases for asphalt surfaces, thus meeting modern traffic needs and saving the cost of new foundations.
- 3 Reconditioning of old asphalt streets by the heater method, requiring less than one inch of new pavement.
- 4 Utilization of "black" base for new construction, thus simplifying the problem of underground service cuts and pavement replacements.
- 5 Use of "non-skid" asphaltic surfaces on grades.

Many cities have reported successful results along these lines, their experience being set forth in a survey made by a committee of eminent engineers and now in course of publication by The Asphalt Institute. *Write for information.*

## *The* ASPHALT INSTITUTE

A national institution not organized for profit but for constructive, educational and research activities. Representing 85% in volume of the asphalt producers in the United States and Canada.

801 SECOND AVENUE (at Forty-third Street), NEW YORK, N. Y.

**Visit the Asphalt Institute Booth No. A-125 at the Road Show.**



present will include R. S. Cooper, Pres.; M. J. Harkless, F. J. Passino, H. E. Linney and C. H. Carl.

**Ingersoll-Rand Co.**, New York, N. Y., will exhibit the following equipment: an X-71 drifter type rock drill on Type D wagon mounting, a Type 20 10 x 8 portable compressor on rubber-tired wheels, a Type 20, 5½ x 5 portable compressor on steel wheels, a cross-sectional assembly of the free air unloader used on Type 20 portable compressors, Type 30 air-cooled portable compressor of 30-cfm piston displacement, a No. 50 drill steel sharpener, a complete display of jackhammers, paving breakers and pile drivers and a complete line of pneumatic tools applicable to road and bridge work. The Type 30 portable compressor will be shown for the first time. It will operate one or two pneumatic tools and is designed to furnish air for such services as grinding, chipping, sealing, concrete surfacing, paint spraying and the like. This exhibit will occupy Booths B-54 and B-69, with George Williams, Mgr., Portable Compressor Dept., in charge.

**International Harvester Co.**, Chicago, Ill., will show in Booth A-16 five International motor trucks with dump and hoist equipment, and three McCormick-Deering industrial tractors with special road building equipment. The sales representative in charge of the motor trucks will be G. B. Abbott and the representative in charge of the industrial tractors, W. M. Parrish.

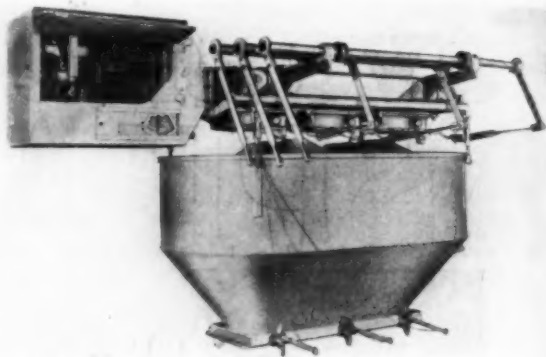


*The New Cedar Rapids Bituminous Road-Mixer*

**Iowa Manufacturing Co.**, Cedar Rapids, Iowa, will occupy Booth A-29 and will also have a large outside exhibit near Exhibition Building A. The inside exhibit will consist of a 336 reduction crusher, a 936 primary crusher, and 916 crusher on an industrial tractor with front loading skip and the outside exhibit will include a 936 one-piece outfit and the new bituminous road-mixer. The following members of the organization will be present: Howard Hall, Pres. & Treas.; W. Guy Frazee, Vice Pres. & Gen. Sales Mgr.; Kenneth Lindsay, Asst. Sales Mgr.; A. C. Gossard, Sales Dept.; E. C. Gee, W. V. Wellman, H. F. Saxton, R. B. Waite, F. W. Lake, J. D. Aldrich and A. L. Bruyneel, Salesmen.

**Irving Iron Works Co.**, Long Island City, N. Y., will exhibit the Irving Unified reinforcement and armor for bridge floors, an adaptation of Irving steel mesh flooring to the bridge slab problem, combining a bottom system of Irving mesh flooring as a tension member and a top system of the same as a compression member and at the same time a surface armoring for the top of the concrete slab. Irving continuous armoring for bridge floors and highways will also be on display. P. L. Price, Vice Pres. & Chief Engr., will be in charge.

**C. S. Johnson Co.**, Champaign, Ill., will feature in its



*The New Johnson Multiple Material Weigh Batcher Which Will Handle Three Aggregates*

exhibit the new Johnson multiple material weigh batcher especially designed for paving contractors. This batcher is constructed to handle three aggregates and is divided into three compartments, the weight of each compartment being controlled by a separate beam which eliminates any adjustment after the beams are once set. The exhibit will also include the improved Bantam-Weigh batcher, a new bulk cement handling cart and standard single material weigh batchers for sand and stone. C. S. Johnson, J. C. McLean and K. H. Melzer will represent the company.

**Joy Manufacturing Co.**, Franklin, Pa., will occupy Booth A-28a, with Walter M. Dake, Consulting Engineer in charge of Sales, A. S. Knoizen, Asst. Mgr., and William H. Seabright, Asst. Sales Mgr., in attendance. The exhibit will consist of photographs, motion pictures and literature of the Joy underground and top ground loading equipment. The movies will show the Joy working in coal mines, coal yards, sand, gravel and snow.

**Killefer Manufacturing Corp.**, Los Angeles, Calif., will exhibit in Space A-48 in Building A a road disc for removing corduroy from asphalt macadam roads, models of road rippers for tearing out old road material, road rooters for similar purposes, revolving fresnos, a road scarifier for shallow work and tools for mole drainage along roadsides. The representatives in attendance will be C. G. Wuthrick, Cleveland; Wm. Hauserman, Oklahoma City; W. L. Franks, Cedar Rapids; E. C. Collier, Minneapolis; A. P. Olinger, Wichita; E. F. Carlmark, Los Angeles, and O. P. Robb, Gen. Sales Mgr., Los Angeles.

**Kinney Mfg. Co.**, Boston, Mass., will exhibit at Booth AR-7 and will show a Kinney junior distributor. The representatives in attendance will be William R. Worcester, Mgr., Philadelphia office; E. F. Bender, Mgr., New York office; A. J. Munday, Mgr., Chicago office; Harold Saunders, Mgr., Kansas City office and Claude Hill, of the Boston office.

**Kohler Co.**, Kohler, Wis., will feature its Model EH 1½-kw 110-volt self-contained electric plant, especially adapted for mounting on sledges, excavators, draglines, dredges, ditchers, pavers and other construction equipment. This unit is compact, measuring 16 x 37 x 35 inches, and a strong sheet metal housing protects its 4-cylinder engine and direct-connected generator from the elements and also encloses a 7-gallon gasoline tank. Three different models of Kohler plants, one a cut-away type, will be on display.

**Lakewood Engineering Co.**, Columbus, Ohio, will exhibit in A-12 and A-19 a Lakewood finishing machine, a sub-grader, road forms, graderooter, straight-edges and float-bridges. Those in attendance will be Lion Gardiner, Pres.;

# Service—the kind you want

NATIONAL CONSTRUCTION CO.  
GENERAL CONTRACTORS  
308 ARTHUR BUILDING  
OMAHA, NEBR.

Nov. 20, 1930.

The Philip Carey Co.,  
334 Keeline Bldg.,  
Omaha, Nebr.

Gentlemen:

We wish to thank you for the splendid way in which you handled our Joint requirements this past year. We were especially pleased with your prompt delivery on our smaller rush orders.

In every instance delivery was made by the date promised and this is the kind of service only road contractors can fully appreciate.

Yours very truly,

NATIONAL CONSTRUCTION COMPANY

By *R. J. Wickham*

See us at Booth A-80  
at the Road Show

## Other CAREY Products

ELASTITE BRIDGE FLOORING  
BUILT-UP ROOFS  
CAREYSTONE CORRUGATED  
CAREYSTONE SHINGLES  
HEAT INSULATION  
ASBESTOS PRODUCTS  
ROLL ROOFINGS  
ASFALTSlate SHINGLES  
ROOF COATINGS  
WATERPROOFING MATERIALS  
ELASTITE RAIL FILLER

CAREY Elastite Expansion Joint is on the job when needed—and you know what that means on concrete paving. Stocks are carried in every important city in the country, and any size order can be delivered without delay.

CAREY Service keeps pace with the demand for Elastite Expansion Joint, which has proved its value in concrete paving for almost 20 years. Road builders who wish a proved product and insurance against costly delays, depend on CAREY Elastite. Write for current price list and trade discounts.

**Carey Elastite**  
EXPANSION JOINT

THE PHILIP CAREY COMPANY — Lockland, Cincinnati, Ohio



R. W. Cornelisen, Asst. Gen. Sales Mgr., and T. W. Dieckmann, Mgr., Paving Dept.

**LaPlant-Choate Manufacturing Co.**, Cedar Rapids, Iowa, will show in Booth A-17 the following equipment: a Roll-Over scraper, a DW-7 with hydraulic lift on the front and hand lift on the rear, a BF-30 on a Caterpillar Thirty, two bull-scoops on Caterpillar Tens, a DW-8 3-way dump wagon with a Caterpillar Sixty and a Roll-Over scraper with a Caterpillar Thirty. R. E. Choate, Pres.; H. N. Graves, Secy. & Sales Mgr.; C. B. Cooper, E. A. Stewart, G. A. Bailey, T. Nerhaugen and W. L. Leech, Salesmen, will be in attendance.

**Lee Transit Mixer Co.**, Indianapolis, Ind., will exhibit in Booth B-76 a 1-cubic yard Lee-Mix mixer mounted on a Ford chassis. J. B. Shepherd and R. F. Lee will represent the company.

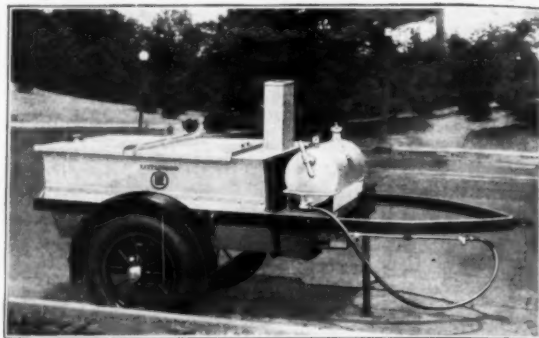
**LeRoi Co.**, Milwaukee, Wis., will have on display in Booth B-56 a 4-cylinder 7 to 12-horsepower Model WP-7 LeRoi engine, together with some of the major parts used in these engines. C. W. Pendock, Pres., and W. R. Karll, Sales Mgr., will be in attendance.

**A. Leschen & Sons Rope Co.**, St. Louis, Mo., will have on exhibition at Booth A-32-A samples of the various kinds of wire rope which are recommended for use on all types of road building equipment. There will also be a machine from the company's testing laboratory which will show some of the rigid tests on every wire before it goes into wire rope bearing the Hercules mark. The following sales representatives will be in attendance: E. J. Schillinger, E. E. Hickok, J. E. Seale, and Wm. Berninger.

**The Linde Air Products Co.**, New York City, will display the following products in Booth A-115: Prest-O-Lite floodlight attachments which made Presto-O-Lite dissolved acetylene available for floodlighting; an Oxweld Type W-17 welding blowpipe and cutting attachment, the Oxweld Type R-43 oxygen welding regulator, and portable oxy-acetylene welding and cutting outfits useful in the maintenance and repair of road-building machinery; Prest-O-Lite headlights for road machinery, tractors, trucks and snow plows; earbie portable floodlights for night construction work; the new Prest-O-Lite primer for starting truck and tractor gasoline engines; the Oxweld portable tensile testing machine and a new bend-test machine which will be operated to demonstrate the strength and ductility of oxy-acetylene welded joints; specimens of steel welds and of bronze welds in cast iron; Haynes Stellite applications to scrapers, dipper teeth and other parts exposed to abrasive wear. J. J. Foster will be in charge.

**Linn Manufacturing Co.**, Morris, N. Y., will exhibit a Linn tractor equipped with a 100-horsepower Waukesha motor dump body hoist. This company's booth is A-106 and P. W. Gould, Sales Mgr., and B. F. Lease, Central Zone Mgr., will be in attendance.

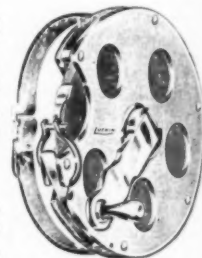
**Littleford Bros.**, Cincinnati, Ohio, will feature in its exhibit a No. 84-HD asphalt kettle equipped with Timken roller bearings and pneumatic tires. This kettle may be trailed 30 or 35 miles an hour and the burner may be kept in operation while the kettle is being trailed so that asphalt can be melted on the way to the job. Other outfits to be on exhibition are the Trail-O-Heater, a 300-gallon asphalt kettle, a motor-driven emulsion sprayer, concrete heaters with Universal attachment for tilting and non-tilting drum mixers, a heavy duty all-steel tool box for highway depart-



*The Littleford 84-HD Pneumatic-Tired Trailer Type Asphalt Kettle*

ments and contractors, the No. 90 combination tool heater and the A. C. kettle. This display will be in Booth B-43, with L. W. Glaser, Sales Mgr., in charge.

**Lufkin Rule Co.**, Saginaw, Mich., will exhibit in Booth A-122 its line of steel and woven measuring tapes in all sizes and patterns, metal and wood rules and precision tools. R. M. Benjamin will be in charge of this exhibit.



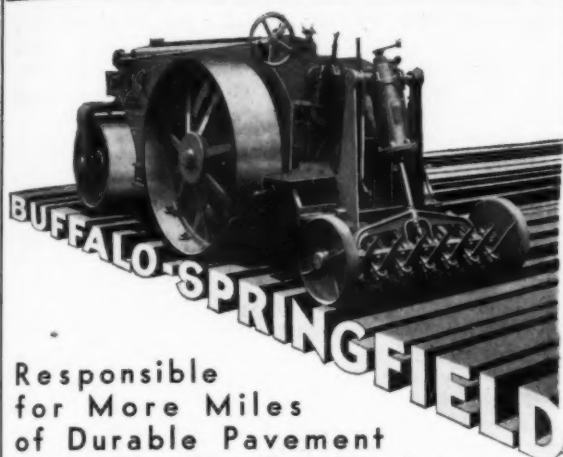
*Wolverine Measuring Tape*

**The Macleod Co.**, Cincinnati, Ohio, will show a number of different sizes of oil-burning tar and asphalt kettles, including one of the latest improved designs in a large size, as well as a tool heater, a concrete mixer heater, several small portable oil burners, a sand blast machine, a paint sprayer and a highway weed mower. James Lauder will be in charge of the exhibit, and Walter Macleod, Pres., will also be present.

**Malleable Iron Fittings Co.**, Braintree, Conn., will feature the standard compression spring anchorage for highway guard cables, with alternative set-ups, including the adapter unit construction. There will be posts showing the various types of offset pillow blocks and guard cable holders with the proper hook bolts and J-bolts. This compression spring anchorage provides automatic adjustment for expansion and contracting of guard cables from season to season, with further finer adjustment provided by the retaining nut, if the cable tensions must be kept closer within predetermined limits. This exhibit will be located in Booth B-123, with F. W. Kennedy, Sales Mgr., Pole Hardware Dept., and R. G. Williams, Engr., in attendance.

**W. R. Meadows, Inc.**, Elgin, Ill., will display in Booth A-97 its asphalt pre-moulded expansion joint, asphalt bridge flooring, asphalt plank for protection to waterproofing, asphalt premoulded rail-fillers, and soap-type emulsified asphalts. The representatives in attendance will include W. R. Meadows, President, and J. E. H. Brown, Vice President.

**Metal Forms Corp.**, Milwaukee, Wis., will exhibit in Booth AR-21 road rail, curb and gutter and sidewalk forms, featuring particularly the new 8-inch base form which complies with the specifications of many State Highway Departments. G. H. Miller will be in charge, with R. M. Moss, St. Louis Dist. Mgr.; H. C. Brose, Southwestern Dist. Mgr.; C. B. Kennedy, Chicago Dist. Mgr.; B.



Responsible  
for More Miles  
of Durable Pavement  
Than Can Be Credited to  
All Other Makes Combined

**B**UFFALO-SPRINGFIELD rollers hold this distinction because they embody the finest features of design and construction known to specialized roller manufacture.

Because they combine rugged strength and reliability with a remarkable ease of handling.

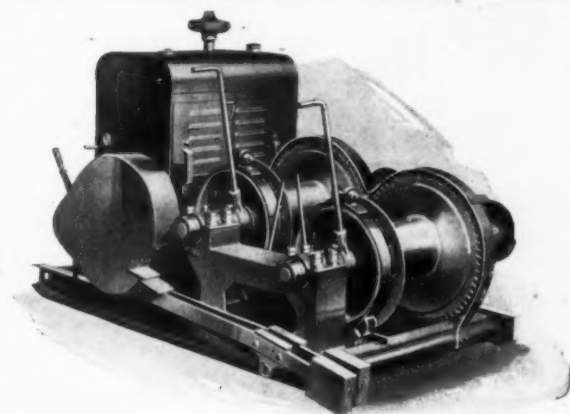
Because they have a reserve of power and stamina far beyond the usual road construction or maintenance requirement.

*Built in a wide range of sizes.  
Steam and motor driven. Scarifier  
and other attachments optional.*

THE BUFFALO-SPRINGFIELD  
ROLLER CO.

SPRINGFIELD, OHIO

**Buffalo-Springfield  
ROLLERS**



## DAKE HOISTS Are Low in Per-Year-of-Service-Cost

**Low in-  
INITIAL  
COST**

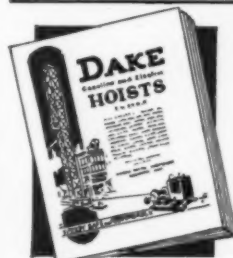
**Low in-  
OPERATING  
COST**

**Low in-  
COST of  
MOVING**

**Low in-  
PER YEAR of  
SERVICE COST**

Dake frames are one-piece electric arc-welded steel assuring continuous perfect alignment and absolute rigidity. Drums are also all-steel electric arc-welded. Every part is made strong and durable. The result is a hoist that will stand up and give dependable service continuously with an exceptionally low maintenance cost.

**DAKE ENGINE  
COMPANY**  
*Grand Haven, Michigan*



DAKE ENGINE CO.  
Grand Haven, Mich.

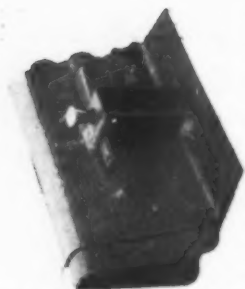
Gentlemen:

Send us by return mail your complete catalog of Dake LG Gasoline and Electric Hoists.

Name.....

Address.....

City..... State.....



*The Metaform Road Rail*

designed to take care of one rock drill, two paving breakers, three trench spades, three riveting hammers, two backfill tampers or other air tools. Another new machine which will be shown for the first time is the 75-cubic foot displacement portable air compressor, of similar design and appearance as the large capacity units.

**Michigan Power Shovel Co.**, Benton Harbor, Mich., will exhibit in Booth AR-23 one shovel unit and two crane units. Walter E. Bernhard, Pres. & Chief Engr.; D. Harrison Millard, Vice Pres. & Sales Mgr.; Don C. Abbott, Secy. & Treas.; Ralph P. Thomas, Dist. Mgr. for Ohio; and L. J. McClure, Service Man, will be in attendance.

**Midwest Locomotive Works**, Hamilton Ohio; will have on exhibition in Booth A-59 one 8-ton and one 16-ton Mid-West gasoline locomotive and a separate four-speed transmission for a Mid-West 16-ton gasoline locomotive. H. Baer, Prod. Mgr., and A. E. Ainlay, Sales Mgr., will be in attendance.

**Mohawk Asphalt Heater Co.**, Schenectady, N. Y., will exhibit its complete line of Hotstuf asphalt heaters, Mohawk Hi-Speed trailer tool boxes, oil burning torches and concrete heating equipment. There will be shown for the first time the new Hotstuf three-in-one combination tool, asphalt and surface heater, three pieces of equipment mounted on a single chassis. It has a heavy channel section chassis equipped with semi-elliptic springs and rubber-tired roller bearing wheels, carrying a tool heating compartment which will handle sixteen paving tools. The asphalt kettle is bolted to the frame and the surface heater is swung beneath the wheels. There will also be on exhibition the Hotstuf lead melting pots, in various capacities up to 500 pounds and in two different models, one a wheel-type with fuel tank attached to the frame, and the other a leg type with separate fuel tank and burner. Both these pieces of equipment are also equipped with Mohawk improved oil burning torches.



*The Moritz Shoulder Finishing Machine*

various highway projects. The exhibit will be located in Booth No. A-104, and E. A. Moritz, Pres.; W. M. Bennett, Vice Pres. & Sales Mgr.; C. J. Moritz, Vice Pres. & Treas., and J. S. Raleigh, Chief Engr., will be in attendance.

**Motor Improvements, Inc.**, Newark, N. J., will exhibit the following equipment: Models 13 and 14 oil burners for

P. Huckins, Wisconsin Dist. Mgr.; Herman Mueller and many other distributors throughout the United States in attendance.

**Metalweld, Inc.**, Philadelphia, Pa., will show for the first time the new M-W Air King Allis-Chalmers tractor-mounted compressor. This compressor, which does not interfere in any way with the general utility of the tractor, has a displacement of 110 cubic feet free air per minute,

suction installation, Models 18 and 19 for pressure installation; Model G heavy duty Purolator for the filtration of fuel oil or lubricating oil in Models 15, 16, 17 and 21; the H-type Purolator which is used for installation on marine and stationary engines and can also be used on bus and truck installations, in Models 3 and 9; Model D-1 twin for diesel installation; B-15H and B-30H heavy duty externally-connector Purolators using the all metal pump cleaned element; a new device known as a water separator, for separating water from air on a compressed air line; a tank filler, which is designed for the use of tractor operators so they may fill their fuel tanks, using the vacuum from the intake manifold, and a new device known as a gasoline hose filter, which is a visible container having built into it a very fine edge filter, to be installed on a gasoline hose just back of the control valve so that all of the fuel may be filtered just before it is deposited in the fuel oil tank of the machine. This display, which will be located in Booth B-93, will be in the charge of L. W. Williams, Sales Engr., with J. A. Graham, Pres.; Mr. Liddell, Chief Engr., and Frank P. Herman, Mgr., Detroit office, also in attendance.

**National Brake & Electric Co.**, Milwaukee, Wis., will have on exhibition in Booth A-107 its line of National air compressors and track-tractors. The following members of the organization will be present: P. L. Crittenden, Vice Pres. & Gen. Mgr.; F. B. Peterson, Sales Mgr.; A. M. Poole, E. A. Haertlein, G. R. Bruner, B. S. Aikman and J. S. Franco, all of Milwaukee; O. S. Compton of Philadelphia; L. M. Pease of Los Angeles and O. W. Swartz of Dallas, Texas.

**National Carbide Sales Corp.**, New York, N. Y., will display in Booth A-85 the National Carbide V-G lights, Handy-Lights and lanterns. R. C. Holcomb, Service Mgr., will be in charge, assisted by F. E. Mull, Engr., at the V-G light factory, and E. C. Aekerman, Western Sales Mgr.

**National Colortype Co.**, Bellevue, Ky., will exhibit in Booth B-162 various adaptations of the new Fireball reflecting buttons, and will have an interesting display of embossed metal signs, highway and street signs, danger signals, etc. The exhibit is in charge of Walter E. Baker, Sales Mgr., and Walter F. Grote, Pres. H. L. Jeffery, Vice Pres., and W. D. Grote, Chairman of the Board, will also be in attendance.

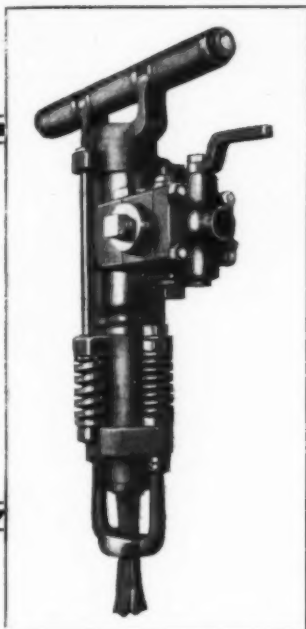
**National Paving Brick Manufacturers Association**, Washington, D. C., will exhibit in Booth 64 photographs of brick pavements in all parts of the country, literature, moving pictures, a model showing a brick-paved city street and intersection, and also a brick-paved rural highway under construction, as well as a model and photographs of the experimental brick pavement on a metal base, recently constructed near Springfield, Ill. The representatives will include F. B. Dunn, Acting Pres.; George F. Schlesinger, Chief Engr. and Managing Director, and Wm. C. Perkins, Consulting Engr.

**National Steel Fabric Co.**, Pittsburgh, Pa., will exhibit in Booth A-64-B its various styles of electrically welded fabric and equipment for handling fabric. H. H. Robinson, St. Louis Dist. Mgr., will be in charge with the following



*A V-G Light*





# PERFORMANCE

You should see this machine perform!  
See for yourself—

Its POWER!

Its SPEED!

Its ENDURANCE!

Tell us about your rock job, and let us recommend the machine best suited to your requirements.

We manufacture a complete line of Rock Drills (in nine different sizes to meet any requirements), also Paving Breakers, Clay Spades, Drill Steel, Air Hose and Pneumatic Sharpening and Shaking Machines.

Send for catalog today

**HARDSOCG WONDER DRILL COMPANY**  
**OTTUMWA, IOWA**

**Good Roads**  
TRADE MARK

**CRUSHERMOBILE**  
A PRODUCT OF  
**GOOD ROADS MACHINERY CO. INC.**  
A COMPLETE SCREENING, CRUSHING AND  
LOADING PLANT. MOVES UNDER ITS  
OWN POWER. NOTHING TO DETACH—

Home Offices  
**KENNETT SQUARE, P.A.**  
Branches  
NEW YORK, WATERTOWN, MASS., CHICAGO  
PHILA., HARRISBURG, PA., PITTSBURGH

Please mention the CONTRACTORS AND ENGINEERS MONTHLY—it helps.

men in attendance: Robert L. Glose, Mgr. of Sales; C. B. Dugan, Chicago Dist. Mgr.; H. D. Stone, Pittsburgh Dist. Mgr.; A. J. Marr, St. Louis office; J. C. Kinzy, St. Louis office, and W. S. Edge, Special Rep.

**N. P. Nelson Iron Works**, Passaic, N. J., will have on exhibition at Booth AR-18, a type Q-7 Nelson bucket loader and a type MC-4 tractor crane. The sales representatives in attendance will include A. A. Nelson, Sales Mgr. and J. L. Nelson, Secy.

**Norma-Hoffman Bearings Corp.**, Stamford, Conn., will show its complete line of sample ball, roller and thrust bearings, featuring particularly its new Greaseal felt protected ball bearings which incorporate complete protection at one side by the use of a felt washer supplied with the bearing. This exhibit, which will be located in Booth B-80, will be in the charge of T. J. Harley, Chicago Dist. Rep. H. J. Ritter, Asst. Secy.; T. E. Rounds, Jr., Engr. Dept., and D. W. Robinson, Sales Rep., will also be present.



*A Greaseal Bearing*

**Ohio Locomotive Crane Co.**, Bucyrus, Ohio, will exhibit in Booth AR-5 an Ohio excavator and the Ohio tractor dump wagon. H. R. Williams, Sales Mgr.; H. H. Turner and A. H. Gray, Sales Engrs.; H. S. Mustin, Research Engr.; and C. A. Michael, Works Mgr., will be in attendance.

**Henry Pels & Co., Inc.**, New York City, N. Y., will show in Space B-78 one Pels type MAE-16 quadruple combined



*A Perfix Uniheat Heater*

punch, splitting shear, bar, angle and tee cutter, with built-in notcher. This machine, which has a steel plate frame, can be operated by two men at the same time, one working at the punching end and the other at the shearing end. G. W. Thorbahn, Secy., will be in attendance.

**Perfix Corp.**, Milwaukee, Wis., will exhibit a full

line of radiators, unit heaters and blast cores in Booth B-59. Roger Birdsell, T. C. Cornell and R. W. Wilson will be in attendance.

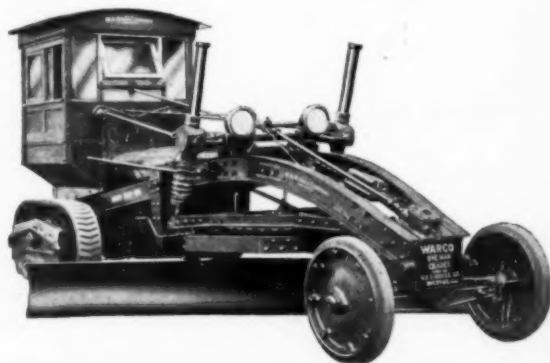
**Pioneer Gravel Equipment Manufacturing Co.**, Minneapolis, Minn., will display in Space No. AR-8 the 1931 Model No. 300-W washing, crushing, screening and loading plant. This plant weighs approximately 50,000 pounds and has scrubbers, screens, crusher and dehydrator all contained in one unit, mounted on wheels. There will also be exhibited a double drum dragline unit for a Caterpillar Sixty.

**Pneu-Hydro Road Machinery Co.**, Cadillac, Mich., will show its pneumatic road planer in Building A, Space A-4. H. E. Price, Vice Pres., will be in charge of the exhibit.

**Portland Cement Assn.**, Chicago, Ill., will have on display technical literature and photographs, including a large picture map of the United States and another map showing the concrete roads in existence to January 1, 1931. It is also planned to display a panel showing the activities of the Portland Cement Association and the benefits of scientific research in pavement design. They will also illustrate the use of single track concrete road construction for local and country roads carrying a light volume of traffic. The booth will be A-2, with M. D. Catton and W. F. Tempest in attendance.

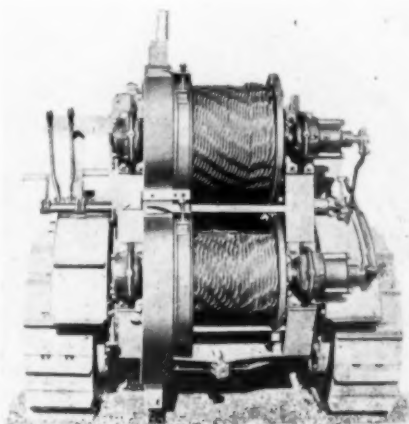
**Relay Motor Corp.**, Lima, Ohio, will display in Space B-82 and 98 a Duo-Drive Model 300A truck and a Model 40A 2½-ton truck with a Heil body and hoist. Those in attendance will be L. A. Graham, W. J. Baumgartner, Alain Madle, R. L. Roush and W. E. Murphy.

**Reo Motor Car Co.**, Lansing, Mich., will show in Booth B-27, a Model GD-144 wheelbase Speedwagon fitted with 2½-yard dump body and hydraulic hoist as well as a Model DF-129 wheelbase Speedwagon with 1¼-yard body. Reo representatives in attendance will include H. W. Roland, W. W. Mitchell, George Person, C. F. Magoffin and B. W. Wilkins.



*A Warco 10-R Power Grader Equipped with Rubber Crawlers*

**W. A. Riddell Co.**, Bucyrus, Ohio, will exhibit the following equipment: a Wareco Model E power grader with rear-type crawlers and bulldozer attachment; a Model 10-R rear control power grader with Model TR rear-type rubber crawlers, which will be equipped with an all-enclosed cab, storage battery, generator and lights and snow plow attachment; and the Wareco 1-yard and 2-yard scoops. This ex-



*Pioneer Dragline Drum Unit Mounted on Caterpillar Tractor*



The WILLIAMS Power Arm builds up power with minimum cable overhaul, combining the lever and block-and-tackle in the one way that avoids all "side leads" of closing cable.

## Use the most powerful bucket built—

### The new WILLIAMS "Champion"

Contractors tell us that this new super-bucket goes beyond anything they have ever had, for hard digging.

Definitely guaranteed to outdig any other bucket built. Write us for complete details and make your own comparisons.

G. H. WILLIAMS COMPANY

609 Haybarger Lane, Erie, Pa.

Branch Offices: New York, Pittsburgh, Chicago

# WILLIAMS

256 BUCKETS—TRAILERS

## "DOMESTIC" PUMPS for CONTRACTORS

*Their Use Means SAFETY SPEED and PROFITS*



### "DOMESTIC" PUMPS

THE STANDARD OF COMPARISON  
FOR A QUARTER OF A CENTURY

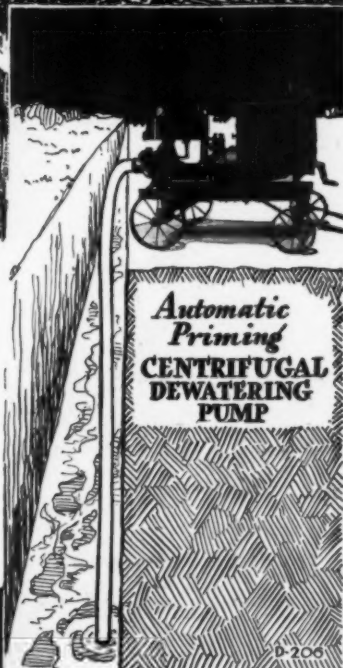
#### WATER SUPPLY PUMPS

Types: Simplex, Duplex, Triplex,  
and Sextuple  
Capacities: 20 to 200 G.P.M.

#### DEWATERING PUMPS

Types: Diaphragm, Plunger and  
Automatic Priming Centrifugal  
Capacities: 100 to 1200 G.P.M.

**Domestic Engine & Pump Company**  
SHIPPENSBURG, PENNA.



### Automatic Priming CENTRIFUGAL DEWATERING PUMP



hibit will be located in Booth A-23 with N. E. Jersey, Road Machinery Sales Mgr., in charge. W. A. Riddell, Pres.; G. M. Schmidt, Gen. Mgr.; G. D. Shaefer, Grader Engg. Dept.; C. A. Henneuse, Crawler Engg. Dept.; and J. E. Patterson, Scoop Engg. Dept., will also be present.

**The Rightway Corp.**, Chicago, Ill., in Booth A-116 will exhibit a multi-wheel drive for industrial tractors, a rotary snow shovel and V-type snow plow. The representatives in attendance will include E. B. Cadwell, M. F. Ashley, O. W. Visser and A. B. Webb.

**Roller Bearing Co. of America**, Trenton, N. J., will exhibit in Booth B-71 where it will show a complete range of sizes of Heliflex bearings from the smallest standard size,  $\frac{3}{8}$ -inch shaft diameter to the largest standard size, 13-inch shaft diameter. Members of the organization who will be in attendance will include C. A. Johnson, Director of Sales; O. S. Livingston, Sales Mgr.; R. M. Page, Mgr., Distributor Sales; S. W. Anderson, Mgr., Chicago Dist.; M. H. Lemell, Chief Engr.

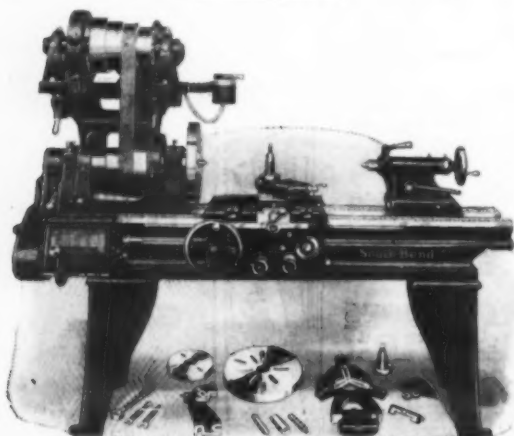
**Rome Manufacturing Co.**, Rome, New York, in Booth A-51 will exhibit a number of models of Rome High-Lift graders including the Rome multi-wheel motor grader. The company will be represented at the exhibit by J. M. Patterson, Gen. Mgr.; G. D. Finney, Sales Mgr., and other sales representatives.



*A Sauerman Cableway Delivering Gravel to the Receiving Hopper on Top of a Screening Plant*

steel. The exhibit will be located in B-67, with James L. Nellis in charge.

**Schramm, Inc.**, West Chester, Pa., will exhibit in B-42 its complete line of portable engine driven compressors, to-



*The New Model South Bend Lathe*

**Sauerman Bros.**, Chicago, Ill., will feature a working model of a Sauerman slackline cableway operated by an electric motor and a similar model of a Sauerman power drag scraper system. Other items on display will include a Crescent scraper bucket and several sizes of Sauerman Durolite blocks with sheaves of heat-treated cast



*The New Diesel Engine Driven Portable Air Compressor*

gether with pneumatic tools and accessories, featuring particularly the new Schramm diesel engine driven compressor, having a displacement of 360 cubic feet of air per minute. A. O. Witt, Mgr., Sales Promotion, will be in charge of the exhibit.

**Shunk Manufacturing Co.**, Bucyrus, O., will feature its Camel automatic dump, which will be shown for the first time. Other equipment on exhibition will include the Success twin dual road main tainer, Shunk traffic markers and grader blades. Those in charge of the exhibit, which will be located in Booth A-58, will be C. H. Richardson and G. H. Fegley.



*The New Camel Automatic Dump*

**Simmons Hardware Co.**, St. Louis, Mo., will have on display hand tools and other hand equipment of interest to contractors and highway maintenance officials. This exhibit will be in Booth B-108, with J. J. Higgins, Mgr., Highway Contract Dept., in charge.

**Sinclair Refining Co.**, New York, N. Y., will have on exhibition in Booth A-117 a display of petroleum products for use in all kinds of road building machinery. G. French of the New York office will be in charge, assisted by P. H. Palister, Chief Engr., Western Dist.; N. A. Wilson, Automotive Engr., Western Dist.; and W. E. Hamilton, City Sales Mgr., St. Louis.

**Sivyer Steel Castings Co.**, Milwaukee, Wis., will show at Booth A-124 alloy heat treated castings for road machinery as well as graphs and charts. Its sales representatives will include Martin A. Fladoes, Vice Pres., in charge of sales; V. C. Mekeel, Sales Engr.; and Arthur H. Oberndorfer, Adv. Mgr.

**Snap-On Tools, Inc.**, Kenosha, Wis., will exhibit in Booth B-88 the complete line of Snap-On socket wrenches and Blue Point mechanics' tools, including the new set of Snap-On Giant sockets and handles and the new ratchet wrenches. Those in attendance will be Stanton Palmer, Pres.; N. T. Tarble, Gen. Sales Mgr.; Joseph Johnson, Vice Pres. & Treas.; F. H. Wendell, St. Louis Branch Mgr., and C. H. Tennyson, Research Engr.

**South Bend Lathe Works**, South Bend, Ind., will exhibit three new model South Bend lathes and will be represented by F. C. Erhardt, Sales Mgr., and R. S. Young, Engr.

# BETTER THAN EVER

A SUPER OIL, TAR and ASPHALT DISTRIBUTOR

DON'T FAIL  
TO VISIT US  
AT THE ROAD  
SHOW

for  1931

VISIT SPACE  
B-31A  
SAINT LOUIS  
ROAD SHOW

That is what

STATE OFFICIALS, COUNTY OFFICIALS and CONTRACTORS  
will find embodied in the 1931

## "ETNYRE MODEL F"

Designed and built to maintain and produce the best kind of BITUMINOUS ROADS  
by applying the material in just the right amount at the proper temperature.



This is an actual photograph of an "ETNYRE MODEL F" applying 7/10 gallons per square yard, asphalt heated to 340 degrees F. with 18' spray bars on the Sanford-Orlando Road No. 3 in Florida. This is a splendid example of

"ETNYRE FULL WIDTH DISTRIBUTION"

The first application of 2 gallons per square yard was also applied with 18' spray bars.

Let us send you bulletin No. 503 giving specifications and more interesting facts.

Manufactured by

**E. D. ETNYRE & COMPANY**

Oregon, Illinois

SALES OFFICES IN PRINCIPAL CITIES

## An Economical Earth-Moving Machine With a Wide Range of Usefulness

FOR digging gravel from a bank, making a cut-and-fill, grading rough land, or doing any work where material has to be excavated and hauled a distance of several hundred feet, there is no machine quite the equal of

## The SAUERMAN DRAG SCRAPER

Excavating and conveying are merged into one when you use this machine. Your equipment investment is less, your operating expense is less.

One man operating a Sauerman Power Drag Scraper will dig and move 150 to 4,000 cubic yards of earth materials per 10-hour day, these figures representing the capacity range from the smallest portable units to the big Sauerman stripping and levee-building machines equipped with scraper buckets which take 10 cubic yards at a "bite."

All the interesting features of this labor-saving equipment are described in detail with illustrations of more than 100 different installations, in our Catalog No. 10. Write for your copy of this book now.

See us at the Road Show—Space B-67

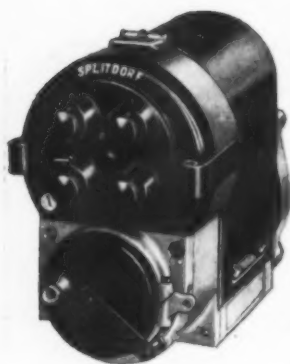
**SAUERMAN BROS. INC., 464 S. Clinton St., Chicago, Ill.**



The above illustration shows a Sauerman Drag Scraper making a long cut-and-fill for a road.

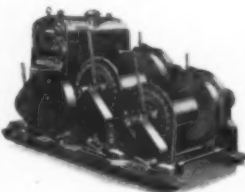


This shows a Sauerman installation with self-propelling head tower—a popular type of machine for levee work.



*The Splitdorf Heavy-Duty  
Model B Magneto*

**Sterling Machinery Corp.**, Kansas City, Mo., will have on exhibition at Booth AR-15-A a Sterling Type A double friction drum hoist equipped with a Hercules power unit, a Sterling Type C double friction drum hoist equipped with a LeRoi 4-cylinder gas engine, a Sterling 3-inch positive priming centrifugal pumping unit, a Sterling 2-inch positive priming centrifugal unit and a Sterling 85-gallon per minute 500-pound pressure 4-cylinder road builder's pump with a 4-cylinder Hercules engine.



*A Type A Double Drum  
Hoist Equipped with Her-  
cules Engine*

**Stover Mfg. & Engine Co.**, Freeport, Ill., will show a number of models of its engines at Booth B-58. Lee Madden will be in charge of the exhibit.



with the new style cam steel container.

**Timken Roller Bearing Co.**, Canton, Ohio, will occupy Space B-23 and will feature a display to show the capacity of tapered roller bearings for carrying heavy thrust loads as well as reducing friction. The company will be represented by L. M. Klinedinst, Vice Pres.; R. P. Proffitt, Dist. Mgr. of Industrial Sales, St. Louis; V. Steele, Industrial Rep., St. Louis; G. D. Thewlis, Dist. Mgr. of Industrial Sales, Chicago; J. W. Weir, Dist. Mgr. of Industrial Sales, Canton, Ohio, and G. W. Curtis, Dist. Mgr. of Industrial Sales, Milwaukee.

**Tite Flex Metal Hose Co.**, Newark, N. J., will exhibit Tite Flex all metal flexible tubing as used for original equipment for fuel lines on trucks, tractors, buses and airplanes to replace solid tubing for this purpose, in Booth B-119. Its representatives will include Elbert E. Husted, Sales Mgr., and J. M. Borland, Sales Engr.

**Splitdorf Electrical Co.**, Newark, N. J., will have on exhibition in Booth B-62 its complete line of magnetos and spark plugs. Those in attendance will be E. D. Roach, Equip. Sales Mgr.; Lee L. Sable, Sales Engr., and Jack Binney, Sales Rep.

**St. Paul Hydraulic Hoist Co.**, St. Paul, Minn., will show in Booth B-131 its line of St. Paul hoists for dump trucks. V. L. Farnsworth, Fred Bell, Jr., and Harold H. Miller will represent the company.

**Toledo Pressed Steel Co.**, Toledo, Ohio, will exhibit in Booth B-72 Toledo torches and horses. Lyman W. Close, Vice Pres., will be in charge.

**Toncan Culvert Manufacturers Association**, Massillon, Ohio, will feature corrugated metal culverts made of Toncean iron in Booth A-81 and A-87. J. T.



*Republic Corrugated Culvert*

Hay, Manager of the Association, will be in charge of the Booth, and the representatives will include L. M. Berry, Adv. Mgr.; A. J. Roof, Republic Steel Corp.; L. D. Mercier, Asst. Mgr. of Sales, Sheet and Tin Plate Division of the Republic Steel Corp.

**Trackson Co.**, Milwaukee, Wis., will feature the new Trackson Model GH crawler, an all-purpose heavy duty crawler with a wide range of usefulness. This crawler will be equipped with the new Trackson high shovel for digging and loading which may be mounted on a wheel tractor or on the Trackson crawler unit. Model LH Trackson, a lighter and faster crawler than the heavy duty Model GH, will also be on display, equipped with a Trackson hoist. The Trackson crawler wheels, designed for mounting on wagons and trailers of various makes, will be shown in the 6-ton, 10-ton and 15-ton sizes. This exhibit will be located in Booth A-28, with L. E. Dauer, Sales Mgr.; W. H. Stiemke, Gen. Mgr.; and other representatives in attendance.

**Transit Mixers, Inc.**, San Francisco, Calif., will exhibit in Booth B-133 one or more Paris Transit mixers of current design as well as projection equipment showing the uses of these mixers on various construction operations. Edwin F. Hill, Jr., Sales Mgr., will be in charge of this exhibit with other officers and field representatives in attendance.

**Trucktor Corp.**, Newark, N. J., will show a Ford Trucktor attachment consisting of an extra pair of dual tired wheels applied in front of the rear axle of the truck, as well as with the special Trucktor spring suspension system and manganese steel tracks. These tracks can readily be detached in a few minutes, and the truck is then ready to operate over the highway. The Hug Co., in Space B-35, will also exhibit a truck equipped with the Trucktor track system. The Trucktor exhibit will be located in Booth B-51-99, with Clayton Farris, Pres., and Charles R. Lord, Vice Pres., in attendance.

**Trusecon Steel Co.**, Youngstown, Ohio, will have on exhibition at Booth A-6 its welded steel fabric, air cushion expansion joints, dowel construction joints, curb bars, rib bars and steel road forms as well as two new products, Trusecon all-steel highway guard posts and Trusecon all-steel highway crossings.

**Twin Disc Clutch Co.**, Racine, Wis., will exhibit a variety of sizes and types of clutches, together with several different sizes of gear reduction units and power take-off units. The booth will be B-57, with G. M. Guilbert, Sales Mgr., in charge. Other representatives of the company who will be in attendance are P. H. Batten, Pres.; W. C. Gewalt, Vice Pres.; W. L. Dixon, Eastern Dist. Mgr.; J. B. Jenkins, R. H. Smith and N. F. Adamson, Sales Engrs.

**Union Steel Products Co.**, Albion, Mich., will have on exhibition in Booth B-73 its new line of dowel bar supports, marginal bar supports, dowel sleeves, bar mat ties, tapered pins, mat supports, bar spacers and supports for bridges, beam wrapping and similar items. D. H. Bitney, Sales Mgr., will be in charge.



## CONWEIGH ROLLROUND LOADER



Wheels set for longitudinal movement

A wheeled-type belt-conveyor unit having adjustment features for conveyor and wheels that give a wide range of application for handling granular or lump material. The conveyor boom has an automatic safety-lock on elevating mast.

Wheels have a swivel adjustment allowing a pivotal, lateral or longitudinal movement of the loader.

Belt troughing and return idlers and the foot-supporting roller have protected ball-bearings with Hyatt bearings in wheels.

Raising or lowering easily made by self-locking worm and worm-gear winch.

Loader sizes range from 18 to 30 feet lengths with belts 16 to 24 inches wide, for 40 to 150 cu. yds. per hour capacity.

Either electric motor or gasoline engine will be supplied as desired.



Wheels set for pivotal or lateral movement

**THE CONVEYING WEIGHER CO., 90 WEST ST., N. Y. C.**

## ADAPTABILITY - CHARACTERISTIC OF THE HELTZEL WEIGHING PLANT

The Heltzel Trailer-Type Weighing Plant can be furnished in six sizes with capacities ranging from 26 tons to 150 tons, and for the handling of one, two, three, or more materials. The capacity of the 26-ton unit can be easily increased to 65 tons by the addition of an inexpensive flared extension.

Weighing is done on a single automatic springless dial scale. Aggregates for varying mixes can be weighed—and every batch back-checked without the setting or changing of any counterpoises or balances.

*Write today for full information*

**THE HELTZEL STEEL FORM & IRON CO.**

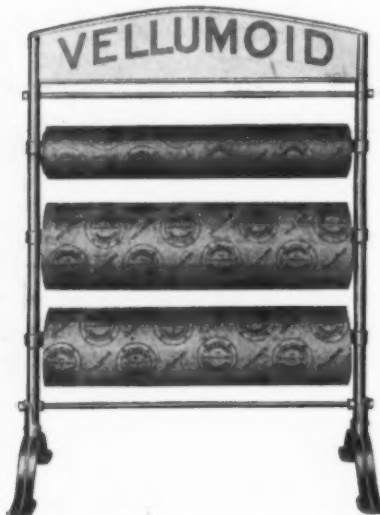
WARREN, OHIO



Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

**Universal Bearing Metals Corp.**, Rochester, N. Y., will have an educational exhibit in Booth B-111, dealing with the hazards encountered in the present day tendency toward higher speeds, increased capacity as well as higher loads.

**Universal Crusher Co.**, Cedar Rapids, Iowa, will exhibit in Booth AR-3 several popular models of their extensive line of jaw crushers and hammer pulverizers, including a 5 x 6 Universal crusher suitable for small capacity crushing and used for laboratory purposes and by concrete products plants, an 8 x 12 Universal crusher used for small stone jobs and in breaking up old foundation, old concrete, etc., a 9 x 16 steel crusher suited for county and township road work and for general road maintenance, an 8 x 10 crusher sectionalized for muleback transportation, an 8 x 36 gravel and rejection crusher for quarry and gravel pit, a 15 x 36 steel crusher mounted on roller bearing steel truck with steel folding elevator and a running model of the 8 x 36 crusher. The representatives will include W. L. Harrison, Gen. Mgr.; L. W. Dunlap, Sales Mgr.; F. L. Shramek, Supt.; R. D. Conway, Engr.; W. W. Simmons and E. A. Velde, Salesmen.



*Vellumoid Sheet Packing in Rolls*

**Vellumoid Co.**, Worcester, Mass., will have on exhibition in Booth B-122 Vellumoid sheet packing and ready-cut gaskets for oil, gasoline and water connections, featuring the suitability of these products for work on all types of road equipment. This material is for gasket replacement. Charles S. Livingstone, Sales Mgr., and George H. Sinnott and M. H. Swanman, Sales Reps., will be in attendance.

**Wallace & Tiernan Products, Inc.**, Belleville, N. J., will exhibit a complete line of dry battery operated highway and marine flashers. A recent development in these flashers is the motor device that will permit of automatic lamp changing regardless of whether or not these flashers are maintained in a strictly perpendicular position. These flashers and their mechanism are now so designed that they may be adapted for use with any of the conventional warning signs or with sign heads of purely local design. This exhibit will be located in Booth A-99, with A. G. Straetz in charge, assisted by George I. Nelson and others of the local field engineering staff.

**Waukesha Motor Co.**, Waukesha, Wis., in Booth B-167 will display a new 6-cylinder engine at 300 to 325-horsepower capacity. Another feature will be the Waukesha 90-100-horsepower diesel engine displayed as a portable power unit and built also for installation in excavators and other industrial machines. There will also be a 6-cylinder industrial unit of a new type which will be first shown at this show. The representatives will include J. M. Boorse, L. L. Bower, F. W. Gargett, H. V. Kilpatrick, J. A. Mahoney, P. C. Ritchie and J. G. Swain.

**Wausau Iron Works, Inc.**, Wausau, Wis., will exhibit four models of Wausau plows at Booth A-57. The plows will include the Model 60X hydraulically operated plow for the Caterpillar Sixty tractor, a Model 35M built for the Monarch 35 tractor, a Model UCT plow built for the Allis-Chalmers U industrial tractor and a Model 200X plow mounted on a FWD truck. The sales representatives will include A. C. Heinzen, W. A. Cramer, J. J. Heinzen and J. J. McKoen.

**West Process Pavement Co.**, Louisville, Ky., will exhibit in Booth A-78 two new products, in addition to the Hot-Lay Westphalt. These products are Cold-Lay Westphalt and Westphalt Retread, the latter being especially intended for the secondary highway system. In addition to moving pictures showing the methods connected with laying Westphalt, there will be a mechanical innovation to show the resiliency of Westphalt. Outside the Arena there will be a model plant to demonstrate both the projection and heating of Westphalt. W. C. West, Pres., will be in charge of the exhibit.

**Western Metal Specialty Co.**, Milwaukee, Wis., will show housings, hoods, fenders and other sheet metal products in Booth B-103, in charge of Lyman McIntosh.

**Western Wheeled Scraper Co.**, Aurora, Ill., will show for the first time an entirely new Western elevating grader, the basis of which is a 12-inch tubular backbone, to give great strength with minimum weight. A separate power unit is used for elevating the dirt after reaching the belt. A Western crawler dump wagon with direct hitch and equipped with the new Western spring wind-up will also be featured. A third new Western machine, to be shown for the first time, is a rotary fresno of 2-cubic yard capacity, strike-off measure, designed and built to utilize the full power of a 60 to 75-horsepower tractor for moving dirt. The booth will occupy Space A-25 and A-43.

**Westinghouse Electric & Manufacturing Co.**, Nuttall Works, Pittsburgh, Pa., will exhibit in Space B-47 show-

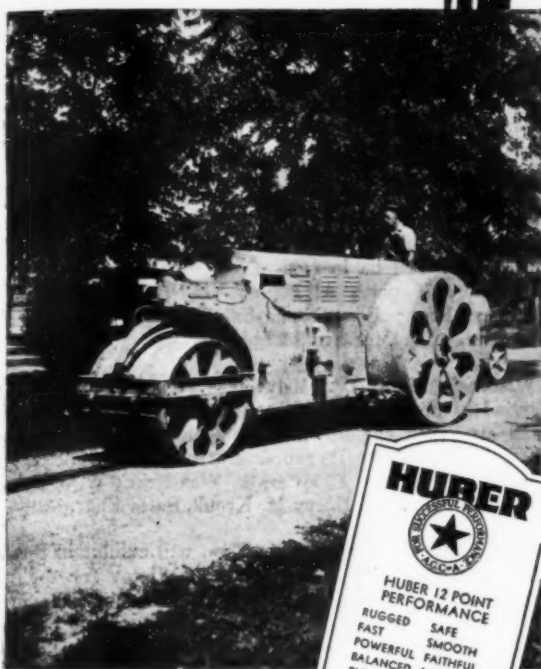


*The Western Engine House*



*The New Waukesha 6-Cylinder Power Unit*

# RUGGED



Huber 10 Ton Road Roller owned by Van Wert County, Van Wert, Ohio.

## ALWAYS "ON TOP" OF YOUR TOUGHEST ROAD JOBS

HERE is a Roller that is built from the ground up, a rugged, powerful road construction tool that can take the hardest knocks of any job and come through with more work to its credit, in less time, at a lower cost than any other roller. Built from 5 to 14 tons. Write for new Huber Catalog.

THE HUBER MFG. CO. 330 E. Center St. MARION, OHIO



# HUBER

## MOTOR ROLLERS



## DREADNAUGHT CRAWLER WAGON



A GOOD crawler wagon must run light, must carry heavy overloads, must withstand extraordinary abuse, and above all must keep running day after day under the most severe conditions. The DREADNAUGHT Wagon is built to do all of these things and is backed by a company forty years old with ten years' experience in the manufacture of all classes of crawler wheel equipment.

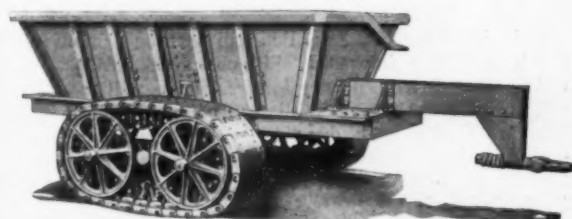
SEE IT AT THE ROAD SHOW

Write for Bulletin

## CRAWLER WHEEL DIVISION

ELECTRIC WHEEL COMPANY

QUINCY, ILLINOIS





ing Westinghouse-Nuttall steering apparatus, including miscellaneous cut tooth gearing used on various kinds of construction equipment, speed reducers, and a new development in motorized mechanical drives.



*A White Model 63 Dump Truck*

**White Co.**, Cleveland, Ohio, will exhibit in Space B-16 a White Model 64, a 6-cylinder chassis of 157-inch wheel-base for heavy duty dump trucks and for tractor-trailer operations; a White Model 63 with Wood hoist and dump body, having two swinging partitions to carry dry batches; and a White Model 212 equipped with a No. 2 Heil hoist and 2-yard dump body, suitable for maintenance work. Representatives of the company who will be present are: Saunders Jones, Vice Pres. and Asst. to the Pres.; George F. Russell, Vice Pres. & Sales Mgr.; W. A. Maynard, Sales Promotion Mgr.; H. P. Starbird, who will be in charge of the exhibit, assisted by J. N. Bauman, R. J. Logan, C. I. Fraley, R. E. Laisy, R. S. Lapham, G. R. Ryan and R. J. Soulen.

**Wiard Plow Co.**, Batavia, N. Y., will exhibit one each of its light and heavy all-steel plows, a scarifier or grade ripper and a 4-foot automatic revolving scraper. The number of the booth will be A-64A and those present will be Robert Male, Secy., and Henry Wiard, Asst. Supt.

**Wickwire Spencer Steel Co.**, New York, N. Y., will exhibit in Booth A-100 Clinton electrically welded fabric used in reinforcing concrete construction, a reel and panels of Wickwire Spencer wire rope and several sections of Wickwire Spencer chain link road guard. Those in attendance will be T. H. McSheehy, Mgr., Structural Products Sales, New York; L. P. Smith, Dist. Sales Mgr., Buffalo, and A. A. Wilmot, Asst. Sales Mgr. in charge of Structural Products, Chicago.

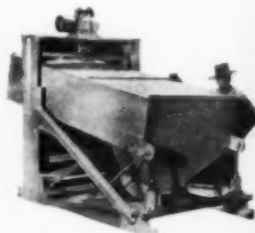
**Wico Electric Co.**, Springfield, Mass., will show Wico magnetos on individual pedestals, equipped for hand operation in Booth B-95. The representatives in attendance will include E. L. Stoughton, Gen. Sales Mgr.; E. E. Hoffman, Asst. Gen. Sales Mgr.; V. K. Hunt, Service Mgr.; C. L. Allen, Service Engr., and W. L. Kaiser, Mid-West Dist. Mgr.

**Willett Mfg. Co.**, Grand Rapids, Mich., will exhibit in Spaces A-82 and A-86 the regular line of Willett spring scrapers as well as the new Willett truck grader.

**G. H. Williams Co.**, Erie, Pa., will have on exhibition at Booth A-52 the improved Williams arch girder trailer which gives increased pay load capacity without added weight and also the 1931 Williams Champion clamshell and Williams double arch dragline bucket. Williams representatives in attendance will include W. C. Swalley, A. J. Lichtinger, C. F. Weiblen, P. T. Robin, G. S. Swanson and H. B. Ackland.

**Williams Patent Crusher & Pulverizer Co.**, St. Louis, Mo., will show one of its large Super-Jumbo type crushers

which will take steam shovel size rock and reduce it to 1¼-inch in one reduction at the rate of 150 tons per hour. There will also be on exhibition one of the Jumbo Junior type crushers which handle one-man size rock, reducing it to 1¼-inch, ¾-inch or agricultural size, depending on the adjustment. The new Kam-Tap vibrating screen for screening sand, gravel, crushed stone and similar materials will be shown as well as an operating model of the Non-Clog crusher for crushing wet, sticky material. This exhibit will be located in Booth A-70, with A. F. Williams, Pres.; Roy Owen, Sales Engr.; and Ray F. Schneider, Adv. Mgr., in attendance.



*A Williams Kam-Tap Screen*

**Wisconsin Motor Co.**, Milwaukee, Wis., will display a 6-cylinder industrial engine, a Model D-2 and also two small air-cooled engines, and a 1½ and 5-horsepower engine at Booth B-169. Its representatives will include H. W. Schnetzky, Pres.; A. F. Milbrath, Vice Pres.; W. J. Johnston, Vice Pres., and Harry M. Kronk, Sales Engr.

**Young Radiator Co.**, Racine, Wis., will exhibit in Space B-114 a large sectional type power radiator for cooling diesel engines, representative types of power unit radiators, including cast tank 5-unit, bolted-together type and pressed steel shell type radiators; two types of truck radiators with cast aluminum polished shell and pressed steel shell; hand radiators for power units, compressors, tractors and similar equipment in several different types with removable cores, sectional type and one-piece integral construction, and Young unit heaters for heating spaces in buildings, warehouse, etc. J. J. Hilt, Sales Mgr., will be in charge of the exhibit, with F. M. Young, Pres.; W. H. Schleck, Secy. & Treas.; Wm. L. Walton, Sales Engr.; G. H. Palm, Chief Engr.; W. V. Astrup, Asst. Chief Engr., and Don Hisey, Supt., also in attendance.

**Zenith-Detroit Corp.**, Detroit, Mich., will occupy Space B-89 and will exhibit there Zenith carburetors and fuel filters designed for industrial equipment use. Those in attendance will be V. I. Shobe, Asst. Gen. Mgr.; H. M. Hall, Sales Engr., and J. T. Blanchford, Branch Mgr.



*The New Willett Truck Grader*

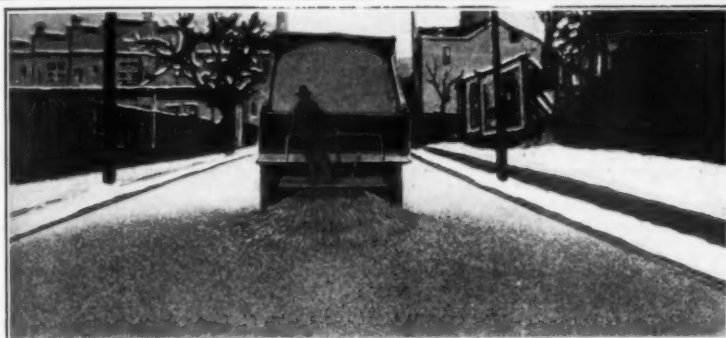
# MORITZ SHOULDER AND BERM MACHINE



**NEWER - BIGGER - BETTER**  
**SPEEDS UP PRODUCTION - CUTS COSTS**

- ENGINEERS LIKE IT - CONTRACTORS NEED IT -  
USED IN MORE THAN TWENTY STATES

**MORITZ-BENNETT CORPORATION**  
EFFINGHAM, ILLINOIS



## "HVASS" SPREADERS

*Conquer Slippery Pavements*

Spread full width street or road at one time or any part thereof.

— SPREAD —

SAND, ASHES OR CINDERS

Can be quickly attached or detached

**CHAS. HVASS & CO., Inc.** Visit Our Exhibit at the Show **508 East 19th St., New York City**

*For More Than a Quarter of a Century*

## EXPORT OFFICE: 30 Church St., New York City - CABLE ADDRESS: Brooklyn **LAKEWOOD**

*Has Served the Construction Industry*

### PAVING EQUIPMENT

FINISHING MACHINES  
SUBGRADERS  
CARE ROAD FORMS  
GRADEROOTERS

FLOATBRIDGES  
ALUMINUM STRAIGHT EDGES  
BATCH BOX CARS  
STEEL BATCH BOXES

NARROW GAUGE TRACK AND V-DUMP CARS

### CONSTRUCTION EQUIPMENT

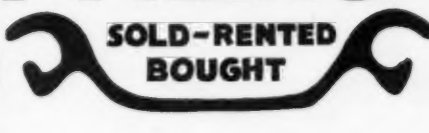
CONCRETE MIXERS  
STEEL TOWER S  
CHUTING EQUIPMENT  
MAST CHUTE PLANTS

CONCRETE CARTS  
CONCRETE BUCKETS AND CARS  
CLAMHELL BUCKETS  
BIN GATES

Write for Bulletins

**THE LAKEWOOD ENGINEERING CO.,** 520 Dublin Ave., Columbus, Ohio

## STEEL SHEET PILING



CUT YOUR COST ON STEEL PILING THROUGH OUR RE-PURCHASE GUARANTEE. SHIPMENTS MADE FROM CENTRALLY LOCATED WAREHOUSE STOCKS.

FOR FOUNDATIONS. COFFERDAMS, DOCKS, WHARVES, HARBORS, SEWER WORK, CAISSONS, BULK HEADS, DOCK AND QUAY WALLS, RETAINING WALLS AND SIMILAR STRUCTURES.

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**S·W·LINDHEIMER INC.**

385 Dearborn St.  
CHICAGO

# CATALOGS for CONTRACTORS

These especially selected catalogs and pamphlets of value to contractors are for free distribution. You will find it worth while to check these lists each month and write for the catalogs you need.

## ECONOMICAL PORTABLE AIR COMPRESSORS

Air King portable air compressors mounted on steel rubber-tired wheels or for mounting on trucks and which have long-run economy and unusual efficiency and maximum labor saving are fully illustrated in a catalog which may be secured from Metalweld, Inc., 26th & Hunting Park Ave., Philadelphia, Pa.

## WELL-BUILT WATER METERS

Neptune meters which are being made better through the use of renewable heat-proof, hard-rubber bushings on all spindles of the gear train and register, are completely described in literature which may be secured from the Neptune Meter Co., 50 East 42nd Street, New York City.

## EXCAVATING FOR PROFIT

A booklet with this title has been issued by Sauerman Bros. Inc., 464 S. Clinton Street, Chicago, Ill., and it is packed full of interesting and valuable information on the work of slackline cableways on practically every kind of excavating job. There are many pictures and diagrams showing just how the cableway digs, conveys and elevates.

## CALCIUM CHLORIDE FOR WINTER CONCRETE

Booklet 443 which may be secured from the Solvay Sales Corp., 61 Broadway, New York, discusses the advantages of the use of calcium chloride in increasing the speed of setting and delaying the time of freezing. Those having winter concrete work ahead should be particularly interested in this booklet.

## CUT BACK ASPHALT FOR ROADWAYS

Details on the use of Stanolind cut back asphalt for highway maintenance work may be secured from the Standard Oil Co. of Indiana, 910 So. Michigan Avenue, Chicago, Ill.

## CONCRETE SURFACING MACHINES

The Tensley 7-A surfacer as well as the complete line of Tensley concrete surfacing machines are described in a catalog which may be secured from the Tensley Tool Co., 1965 East 66th St., Cleveland, Ohio.

## CLUTCHES FOR MATERIAL HANDLING MACHINES

If you have a material handling machine which requires considerable power for operation, you need a dependable engine and a truly tried clutch to connect the two. Complete information regarding Twin-Disc clutches for construction and industrial equipment may be secured from the Twin Disc Clutch Co., Racine, Wis.

## LIGHTING UP THE JOB

The use of U. S. electric plants which are compact, portable units capable of lighting fourteen 25-watt lamps with no battery needed are described in an interesting booklet, "Lighting Up The Job," which has been especially prepared for contractors and engineers by the United States Motors Corp., 131 Nebraska St., Oshkosh, Wis.

## MOTORS FOR CONSTRUCTION EQUIPMENT

The investment which contractors make in their equipment is so large that they must pay particular attention to the motor power. Complete descriptions, specifications and power curves covering Waukesha engines for all type of construction equipment may be secured from the Waukesha Motor Co., Waukesha, Wis.

## SEMI-CRAWLER TRACKS FOR INDUSTRIAL TRACTORS

A leaflet entitled "Facts About Moon Tracks" has been issued by the Moon Track Company, Inc., McCormick Building, Chicago, Ill., completely describing these new crawler tracks for McCormick-Deering Models 20 and 30 industrial tractors.

## A PRECISION TWO-SPEED HOIST FOR CRAWLER AND LOCOMOTIVE CRANES

The Thew Shovel Company, Lorain, Ohio, has announced a precision two-speed hoist line control for both present and outstanding models of Thew-Lorain crawler and locomotive cranes. A complete description of this hoist may be secured from the manufacturer by any one interested and particularly those engaged in steel erection or general hook block lifting service where the accurate control of the load is of vital importance.

## A VARIABLE HEIGHT ONE-TON CRANE

The Clark Tractor Co., Battle Creek, Mich., has announced a mobile variable-height crane capable of lifting 1 ton to a height of 15 feet and yet with its boom horizontal it has an overall height of but 7 feet 10 inches. Complete information regarding this crane may be secured from the manufacturer.

## A 4-YARD ELECTRIC OR STEAM REVOLVING SHOVEL

Bulletin No. D-1203 describes and illustrates completely the Bucyrus-Erie 120-B, 4-yard revolving shovel built as a big output machine for ore and rock handling and for electric or steam operation. This bulletin may be secured from the Bucyrus-Erie Company, South Milwaukee, Wis.

## A MEDIUM HEAVY JACK HAMMER

Bulletin 87-D recently issued by the Sullivan Machinery Company, 400 North Michigan Avenue, Chicago, Ill., describes completely the line of Sullivan class L-6 Rotator rock drills of the jack hammer type. These drills are medium heavy in weight and of the dry and water type.

## A CONCRETE ACCELERATOR AND HARDNER

Aqua-Pruf, Inc., 393 Seventh Ave., New York City, will be pleased to send to contractors and engineers complete information regarding this liquid compound which has an affinity for portland cement and which when added one quart to a bag produces a compressive strength 50 per cent in excess of untreated concrete, permitting opening to traffic in 24 hours.

## TRACTOR EQUIPMENT FOR EARTH MOVING

Catalog No. 280 issued by the Baker Manufacturing Co., 595 Stanford Ave., Springfield, Ill., is prepared particularly for contractors and highway officials. It describes in detail Baker Maney self-loading scrapers, Baker one-man rotary scrapers, Baker bulldozers and backfillers, Baker road maintainers and planers and Baker snow plows for trucks and tractors.

## TAR FOR ROAD BUILDING

Contractors and highway officials may secure copies of the latest booklet issued by the Barrett Co., 40 Rector St., New York City, which tells of the best ways to use Tarvia in bituminous road construction and for the maintenance of all type of highways.

## A MIGHTY THOUGH LITTLE HOIST

The Beebe all-steel hand hoist, claimed to be "the strongest geared power for its weight in the world," is a 5-ton straight-line hand hoist weighing only 110 pounds and having a positive internal brake. It is completely described in literature which may be secured from Beebe Bros., 3219 First Ave., So., Seattle, Wash.

## ROAD ROLLERS FOR ALL TYPES OF JOBS

Steam and power rollers equipped with scrapers and scarifiers built with rugged reliability and plenty of maneuverability are described in an illustrated booklet issued by the Buffalo-Springfield Roller Co., Springfield, Ohio.

## EXPANSION JOINTS FOR BETTER CONCRETE ROADS

The Carey Elastite expansion joint which is used extensively throughout the United States and is stocked in every distributing center so that contractors can be supplied promptly is of the asphalt sandwich type, the proper methods of handling and installing which are described completely in literature which may be secured from the Philip Carey Co., Lockland, Cincinnati, Ohio.

## LAYING CAST IRON PIPES WITHOUT POURED JOINTS

The Central Foundry Co., 420 Lexington Ave., New York City, will be pleased to send to contractors, engineers and city officials complete information on the value and service of Universal cast iron pipes for both regular service and emergency water lines with particular reference to the machined joints which permit the pipe being put together with a single wrench without the need for bell holes for poured joints.

## TRAILER TYPE POWER DIAPHRAGM PUMP

The Rex 3-inch diaphragm pump, mounted on a 2-wheel trailer and equipped with a 2-horsepower Stover engine, as well as the complete line of Rex pumps are described in a book which may be secured from the Chain-Belt Co., 1666 West Bruce St., Milwaukee, Wis.

## PORTABLE PLANT FOR ASPHALT STREET REPAIRS

An illustrated catalog covering the Chausse portable asphalt plant which makes an excellent auxiliary plant, and also describing Chausse oil burning tar kettles, surface heaters, fire wagons, concrete mixer heaters, and kerosene torches has been issued by the Chausse Oil Burner, Elkhart, Ind.

## GAS ENGINES FROM 3 TO 180-HORSEPOWER

Le Roi engines which are standard equipment on many pieces of construction equipment and which are made in sizes from 3 to 180-horsepower are completely described in the free literature of the Le Roi Co., Milwaukee, Wis.

## ASPHALT ROAD MAINTENANCE EQUIPMENT

The new Littleford road maintenance equipment catalog which any contractor may secure free on request from Littleford Bros., 485 East Pearl St., Cincinnati, Ohio, describes the complete Littleford line of oil and wood burning asphalt kettles, asphalt and emulsion sprayers, tool boxes, tool heaters and surface heaters, water heaters and concrete heaters, steel mortar boxes, salamanders, joint fillers, squeegee machines, tools and pots, traffic line markers and grout and mastic mixers.


## CURING CONCRETE WITH ASPHALT

The Hunt process of curing concrete with an asphalt spray giving a cured concrete with a strength equal to or greater than water cured concrete, assuring absolute uniformity of curing yard for yard and reducing labor costs to a minimum is described in an interesting booklet which may be secured from McEverlast, Inc., 111 West Seventh St., Los Angeles, Calif.

## INSPECTION OF WELDED STEEL FRAMING IN BUILDINGS


Robert W. Hunt Co., 2200 Insurance Exchange, Chicago, Ill., has reprinted for general distribution this paper by Frans Eder, Mechanical Engineer, of the New York office of the company, which was presented before the annual convention of the International Acetylene Association. Since the welding of steel structures is now a recognized method of steel construction, and the proper inspection of such welded joints is of considerable importance, this paper will be of particular value to both municipal officials and contractors.





**RADIAL BRICK CHIMNEYS**  
*Designed and Built*  
**Old Chimneys**  
*Inspected and Repaired while in Operation.*

*The*  
**NORTHWESTERN**  
 Chimney Construction Co.  
 Fidelity Bldg.  
 CLEVELAND, OHIO





**25-30 HP. Double Drum Hoist**

SEE OUR EXHIBIT AT THE ROAD SHOW  
 LINE PULL 4000 LBS.  
 LINE SPEED 140 TO 210 FT. PER MINUTE

Write for Catalog

**List Price Complete \$1010**

Other Sizes Also Priced Low

Manufactured by  
**STERLING MACHINERY CORPORATION**  
 2300 Holmes St. Kansas City, Mo.



TIMKEN ROLLER THRUST BEARINGS  
 JOHNS-MANVILLE ASBESTOS FRICTIONS  
 ALUMITE-ZERK LUBRICATION  
 HIGH CARBON GROUND PRECISION SHAFTS  
 IMPROVED SCREW THRUST WITH POSITIVE CLUTCH RELEASE

**EBEL**

**DRAGLINE and PUMPING — OUTFITS —**

DRAGLINE HOISTS PILE DRIVER HOISTS CONTRACTORS' HOISTS POWER AND HAND NOZZLE LIFTING HOISTS REVERSIBLE BOTTOMLESS SCRAPERS	SAND AND GRAVEL PUMPS WATER AND PRIMING PUMPS INSIDE AND OUTSIDE FLAP VALVES TAPER WEDGES OIL RESERVOIR SHEAVES
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*See our Exhibit at the Road Show*

**EBEL HOIST & PUMP COMPANY**  
 324-326 So. Hosmer St. Lansing, Mich.


**RUSSELL**  
 Better Built Road Equipment

**RUSSELL "FRESNO" SCRAPERS  
 DRAG SCRAPERS  
 ROAD PLOWS—ROAD DRAGS**

A Complete Line of RUSSELL  
 Spare Parts for Immediate Delivery.

*Write for Catalog No. 30*

**B. W. & LEO HARRIS COMPANY**  
 Minneapolis, Minnesota



**The NATIONAL CARBIDE V. G. LIGHT**

Gives you daylight conditions on night jobs. Spreads a full, even beam of about 8000 candle-power right where you need it. Lights up the job for about nine hours on one 5-pound charge of National 14-ND Carbide and 5 gallons of water.


Is easily handled by one man; has nothing to get out of order; no harm done if it tips over—just stand it up again, and it goes right on working.

Weight 30 pounds empty; 75 pounds when full.

*Write for Catalogs on V-G Light, V-G Handy Light and Lantern*

**NATIONAL CARBIDE SALES CORP.**  
 LINCOLN BLDG. NEW YORK  
 Opposite Grand Central

THE  
**CAMEL**  
 Automatic  
 Gravity Tractor-Dump



**THE SUCCESS**  
 Twin Dual Road  
 MAINTAINER

**GRADER BLADES**  
 —to fit all makes of machines—  
**ROAD SHOW — BOOTH A-58 —**

**SHUNK MANUFACTURING COMPANY**  
 Established 1854 BUCYRUS, OHIO

**If Interested In**

STEAM HOISTS BELT HOISTS CABLEWAYS LOGGING MACHINERY TOWING ENGINES	GASOLINE HOISTS BLAST FURNACE HOISTS CAPSTANS WIRE ROPE BLOCKS	ELECTRIC HOISTS DERRICKS WINCHES CAR PULLERS OR SPECIAL EQUIPMENT
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SEND FOR SPECIAL BULLETINS — ALSO FOR THIS BOOK:

**"Your Own Success"**

**LIDGERWOOD MANUFACTURING COMPANY**  
 430 LIDGERWOOD AVENUE - ELIZABETH, N. J.

**MUNDY HOISTING ENGINES**  
 "Standard of the World"



STEAM—GASOLINE and ELECTRIC HOISTS FOR ALL PURPOSES INCLUDING DREDGE, DRAG SCRAPER, SLACKLINE EXCAVATOR and SCRAPER BUCKET WORK. MINE and INCLINE HOISTS, BELT HOISTS, CAPSTANS and CABLEWAYS. ALSO CAR PULLERS, SHIP CARGO and DOCK WINCHES.

*Catalog upon Request*

**J. S. MUNDY HOISTING ENGINE CO.**  
 722-32 Frelinghuysen Ave. NEWARK NEW JERSEY

35-37 1/2-Hp. Double-Drum Hoist—4500 to 5000 Lbs. Line Pull at 185 feet per Minute Rope Speed.

**TRACTION FOR ACTION**

This is the title of the latest piece of literature issued by the Caterpillar Tractor Co., Peoria, Ill. It depicts and discusses the value of crawler treads as compared to wheels for traction under all kinds of conditions met with in municipal work and in general hauling and construction.

**A DIPPER FRONT WHICH PROTECTS THE TEETH**

The American Manganese Steel Co., Chicago Heights, Ill., which has an exclusive license for the manufacture and sales of Voit dipper fronts which have protective runners and a V-shaped blade to protect the dipper teeth when grading, will be pleased to send a description and costs to any contractor interested.

**DATA ON CAST IRON WATER PIPE JOINTS**

The Hydraulic Development Corp., 50 Church Street, New York City, has recently published a 30-page illustrated data book describing the development of Hydro-Tite, a self-caulking joint compound for cast iron water mains, giving the result of many tests and showing dependable equipment for the handling of this joint material. The booklet may be secured by any municipal official or contractor upon request.

**COMPLETE NEW LINE OF MEDIUM AND HEAVY-DUTY TRUCKS**

The Pierce-Arrow Motor Car Co., Buffalo, N. Y., has announced a complete new line of flexible medium and heavy-duty trucks. These new units include five models arranged from 12,000 to 18,000, 24,000 and 34,000 pounds vehicle gross weight as well as a special 34,000-pound six-wheeler for extra heavy duty. All of these machines are described in literature which may be secured from the manufacturer.

**A NEW COMPLETE PORTABLE GRAVEL WASHING PLANT**

The Pioneer Gravel Equipment Manufacturing Co., Minneapolis, Minn., has developed a new complete portable gravel washing plant known as the Pioneer Model 300W which contains equipment for screening, crushing, loading and washing, and is described completely in literature which may be secured from the manufacturer.

**HYDRAULIC SCARIFIERS AND TAMPING ROLLERS**

The American Tractor Equipment Co., 5301 Horton Street, Oakland, Calif., will be pleased to send a copy of its latest Ateco bulletin which pictures and describes the Ateco tamping roller and the Ateco scarifier, both useful tools in road construction.

**IMPROVEMENTS IN CARBIDE LIGHTS**

National Carbide VG lights and handy-lights, sold by the National Carbide Sales Corp., Lincoln Building, New York City, have been improved recently by a more positive carbide feed plunger and through the adoption of chromium alloy reflectors. Complete information is contained in literature which may be secured from the National Carbide Sales Corp.

**THE PROTECTIVE VALUE OF INDEPENDENT INSPECTIONS**

Pittsburgh Testing Laboratory, Stevenson and Locust Streets, Pittsburgh, Pa., has issued a most instructive booklet of interest to contractors, engineers, and municipal officials discussing the question of responsibility and inspection as well as outlining the broad scope of the inspection service of this laboratory which is available to individuals, corporations and municipalities.

**A FULL REVOLVING DERRICK**

Bulletin B-201, published by the Lakeside Bridge & Steel Co., 200 Villard Avenue, Milwaukee, Wis., completely describes the Lakeside full-revolving derrick designed especially for trestle work such as pile driving and pulling, clamshell or dragline work, placing pneumatic caissons, erecting structural steel and all similar work.

**NEW BULLDOZING STEEL MULES**

Marion Mules, Inc., Marion, Ohio, has announced a new line of steel mules mounted on steel wheels, crawlers, or pneumatic tires, using a McCormick-Deering Tractor as the power unit and which in addition to carrying a load, will bulldoze the material and body when tipped.

**CRAWLER TYPE TRACTORS WITH GREATER TRACTION**

Foot Bros. Gear & Machine Co., 111 N. Canal St., Chicago, Ill., will be pleased to send complete information regarding the new 1931 Bates tractors which have greater traction, simplified construction, oversize parts at critical points, greater riding comfort, easier steering and increased reserve power, all designed to give longer life and lower operating costs.

**AN AUTOMATIC GRAVITY TRACTOR-DUMP**

The Camel automatic gravity tractor dump as well as twin dual road maintainer and grader blades to fit all makes of machines are described in the latest catalog of the Shunk Manufacturing Co., Bucyrus, Ohio.

**YOUR OWN SUCCESS**

This is the title of a book which has been issued by Lidgerwood Manufacturing Co., 430 Lidgerwood Avenue, Elizabeth, N. J., describing and discussing its complete line of steam hoists, belt hoists, cableways, logging machinery, towing engines, gasoline hoists, blast furnace hoists, capstans, wire rope blocks, electric hoists, derricks, winches, car pullers and special equipment.

**THE GENUINE HIGH-LIFT GRADER**

Rome Manufacturing Co., Grader Department, Rome, N. Y., will be pleased to send literature describing the genuine Rome High-Lift grader as well as the Rome Multi-Wheel motor grader, for contractors interested.

**AN INVESTMENT IN SNOW PLOWS**

The latest snow plow catalog of La Plant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa, describes this company's complete line of truck and tractor-mounted plows and particularly the new light-duty hand-operated snow plow for use with or without side wings on Caterpillar Twenty and Thirty tractors.

**A TRAVELING REVOLVING LONG REACH STEEL DERRICK**

The Dayton Whirley Co., Dayton, Ohio, has just published a new 20-page illustrated catalog describing in considerable detail and portraying the advantages and operation of the Wiley Whirley, a traveling, revolving, long reach, heavy-duty, steel derrick for clamshell, dragline and hoisting work.

**AIR COMPRESSOR HOSE AND RUBBER GOODS**

Continental air compressor hose, pneumatic tool hose, suction hose, water hose, steam hose, pile-driving hose, boots and oiled clothing made by Continental Rubber Works, Erie, Penna., are used by progressive contractors on important jobs. A catalog and complete information regarding any one of these products may be secured from the manufacturer.

**PILE HAMMERS THAT DRIVE OR PULL**

A new 112-page pictorial book of pile driving and pile pulling jobs has been prepared by the McKiernan-Terry Corp., 19 Park Row, New York City, showing the work of all sizes of McKiernan-Terry pile hammers. This book will be sent upon request to any contractor asking for it on his business letterhead.

**CALCIUM CHLORIDE FOR WINTER CONCRETE**

Booklet 443 which may be secured from the Dow Chemical Co., Midland, Mich., discusses the advantages of the use of calcium chloride in increasing the speed of setting and delaying the time of freezing. Those having winter concrete work ahead should be particularly interested in this booklet.

**CRAWLER WAGONS FOR HEAVY OVERLOADS**

A good crawler wagon must run light, carry heavy overloads, must withstand extraordinary abuse, and above all must keep running day after day under the most severe conditions. How the Dreadnaught wagon built by the Crawler Wheel Div., Electric Wheel Co., Quincy, Ill., fulfills these requirements is described in a bulletin which will be sent to any interested contractor upon request.

**MOTOR DISTRIBUTORS FOR HOT ASPHALT APPLICATION**

Etnyre heavy bituminous distributors which handle asphalt at 340 degrees applying from 2 gallons per square yard to 7/10-gallon per square yard with 18-foot spray bars are described in detail in the literature of E. D. Etnyre & Co., Oregon, Ill.

**CRAWLER TRACKS WITH BALL BEARINGS**

Euclid "Track-Wheels" roll on ball bearings which make them pull easier and carry capacity loads with less power. The literature of the Euclid Crane & Hoist Co., Road Machinery Div., Cleveland, Ohio, describes this equipment in detail, illustrating its use on dump wagons and pipe and log wagons.

**A CONCRETE CART BUILT FOR SERVICE**

The General concrete cart, every part of which was thoroughly designed to make the hauling of concrete easy, quick and convenient, day in and day out for years, is described in a folder which gives the details of its exclusive design and construction. Write to General Wheelbarrow Co., 3140 East 65th Street, Cleveland, Ohio.

**HALF-ROUND AND FULL-ROUND CORRUGATED CULVERTS**

Contractors should be entirely conversant with the type of corrugated culverts available for the solution of drainage problems. Complete information regarding half-round, flat bottom Gohi corrugated culverts and full-round corrugated culverts may be secured from Gohi Culvert Manufacturers, Inc., Newport, Ky.

**HEAVY-DUTY STEEL ROAD FORMS**

A real heavy-duty steel road form with extra wide tread and double-flanged base with stake pockets which brace the form and distribute the load over the entire base are described in the literature of the Heltzel-Steel Form & Iron Co., Warren, Ohio.

**WELL-BUILT TAR HEATERS**

Pamphlet No. 15 which has recently been prepared by the Jea. Honhorst Co., 1016 W. 6th St., Cincinnati, Ohio, describes the Honhorst oil burning tar heater. Honhorst heaters are made both portable and stationary from 25 to 200 gallons.

**A NEW 3 1/2-T TRAILER MIXER**

The new Lansing 3 1/2-T mixer with a large drum, Hyatt roller bearings, Alemite fittings and Lauson 2-horsepower engine with Wico high-tension magneto is described in literature which may be secured gratis from the Lansing Co., Lansing, Mich.

**A THREE-QUARTER HORSEPOWER GASOLINE MOTOR**

The new Lauson four-cycle 3/4 to 1-horsepower gasoline motor which will run centrifugal pumps, air compressors, force pumps, electric generator and other units, and is completely enclosed, making it adaptable for construction work, is described in literature which may be secured from the Lauson Corp., 11 Jackson St., New Holstein, Wis.

**HANDLING MATERIALS WITH CONVEYORS**

Chicago Automatic Conveyor Co., 1853 South 55th Ave., Cicero, Ill., has issued a number of descriptive bulletins covering the use of Chicago automatic conveyors of the portable and stationary belt type and also bucket elevators and Chicago screens for handling various kinds of materials used by contractors.

**A NEW BAND FRICTION HOIST**

The new Clyde hoist with its self-energizing internal expanding friction, double brake bands, air-cooled brake flanges, roller bearing drums, ring-oiling intermediate shaft bearings, steel cut gears and steel frame is described completely in literature which may be secured from the Clyde Iron Works Sales Co., Duluth, Minn.

**HEAVY-DUTY MOTORS FOR CONTRACTORS**

Continental R series heavy-duty motors designed with interchangeable parts, accurately made and built of the finest material and which provide a surplus of power for truck service are described in the literature of Continental Motors Corp., Industrial Equipment Div., Muskegon, Mich.

**DEPENDABLE HOISTS WITH ARC-WELDED STEEL FRAMES**

Dake Engine Co., Grand Haven, Mich., will be pleased to send you a copy of the new Dake catalog which describes its line of arc-welded steel frame hoists with steel drums, extra horsepower per pound of weight and unusual portability and economical operation.

**GOOD LUBRICANTS PAY**

D-A lubricants cling to metals where ordinary greases and compounds squeeze out or burn up in heavy-duty service. The value of D-A lubricant on construction equipment which receives hard use is described in literature which may be secured from the D-A Lubricant Co., Indianapolis, Ind.

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# Contractors and Engineers Monthly

## DIRECTORY OF EQUIPMENT DISTRIBUTORS

The following cards (arranged by states) show the names of dealers in contractors' equipment and supplies, with a record of the various lines handled. Canadian cards appear on pages 193, 194.

### ALABAMA—ARKANSAS

**C. B. DAVIS ENGINEERING CO.**  
Brown Marx Bldg. Birmingham, Ala.

#### Representing

ROBINS—Belt Conveyors and Screens  
ALDRICH—Power Driven Pumps  
FOSTER-WHEELER—Pulverized Coal Equipment, Superheaters and Condensers  
LO-HED—Electric Hoists  
INDUSTRIAL BROWNHOIST—Locomotive Cranes  
CLEVELAND—Cranes  
WILLIAMS—Buckets

**LAWRENCE-GOODLING CO., Inc.**

#### Contractors' Equipment

161 North Water St. Mobile, Alabama

#### Representing

EDWARDS and BYAN Road Machines  
CLEVELAND Tractors  
HART PAER Tractors  
SIDNEY Wheelers, Drags, Plows  
RANSOME Concrete Mixers, Pavers  
ORTON Cranes, Shovels, Draglines  
AUSTIN Trenching Machines  
C. H. & E. Saw Rigs, Hoists, Pumps  
FAEQUHAR Engines, Boilers, Sawmills

**MINE & SMELTER EQUIPMENT CO.**

#### Construction & Mining Machinery

306-12 South 7th Ave. Phoenix, Ariz.

#### Representing

NATIONAL Air Compressors  
LINK-BELT Shovels, Cranes and Draglines  
LAKEWOOD Mixers, Concrete Placing Equip.  
CLEVELAND—Rock Drills, Air Tools, etc.  
REMMELE Mixers, Small Sizes  
NOVO Hoists, Engines and Pumps  
LINCOLN Stable Arc Welders and Motors  
EDWARDS Wire Rope

**G. C. PHILLIPS TRACTOR Co., Inc.**  
1625-31 Ave. B, So. Birmingham, Ala.

#### Representing

ALLIS-CHALMERS "Monarch" Tractors  
AUSTIN Trench Diggers and Backfillers  
BAKER "Baker Maney" Self-Loading Scrapers  
BYERS Full-Revolving Shovels and Cranes  
CHAIN BELT "Rex" Mixers, Pavers, Pumps, Saw Rigs, Etc.  
DIXOYL Lubricating Greases  
HAISS Loaders and Conveyors  
GALION Road Graders and Machinery  
PIONEER Screening and Crushing Plants  
ROBERTS—Heavy-Duty Trailers, 10-100 Tons  
TOLEDO Torches  
TRACKSON Crawlers, Shovels and Hoists  
Member: Associated Equipment Distributors

**TURNER SUPPLY COMPANY**

N. W. Corner St. Louis & Commerce Sts.  
MOBILE ALABAMA

#### Representing

McKIERNAN-TERRY CORP.—Pile Hammers  
INDEPENDENT PNEUMATIC TOOL CO.—"Thor" Tools and Compressors  
WILLIAMS—Clamshell and Dragline Buckets  
M & M Form Clamps  
ERIE—Bins  
JAEGER—Concrete Mixers  
ORR & SEMBOWER—Concrete Mixers & Hoists  
AMERICAN STEEL & WIRE Co.—"Monitor Wire Rope"  
DOMESTIC—Pumps and Hoists  
LAKEWOOD—Subgraders, Finishing Machines, Forms, Chuting Equipment and Towers  
WYOMING SHOVEL CO.—Red Edge Shovels, Scoops  
LINK-BELT CO.—Crawler Cranes, Shovels, Loaders  
WESTERN WHEEL SCRAPER CO.—Wheelers, Drags, Scrapers, Fresno, Ploughs  
BATES—Bar Ties

**RONSTADT HARDWARE & MACHINERY CO.**

#### "Pioneers in Good Merchandise"

TUCSON, PHOENIX ARIZONA

#### Representing

GALION Graders, Rollers, etc.  
McCORMICK-DEERING Industrial Tractors, Engines  
INTERNATIONAL Motor Trucks  
BAKER Earth Moving Equipment  
BAY CITY Shovels, Cranes, Draglines  
ORD Concrete Finishing Machines  
MUNICIPAL Oil Distributors, Flushers, etc.  
STERLING Hoists  
BRODERICK & BASCOM Yellow Strand Wire Rope  
RED EDGE Shovels and Picks  
KIMBALL-KROGH Pumps  
ALAMO-DORWARD Pumps  
MYERS Pumps

**SMITH-PITTMAN TRACTOR CO., Inc.**

#### Tractors and Road Machinery

520-26 No. 28th St. Birmingham, Ala.

#### Representing

"CATERPILLAR"—Tractors and Road Machinery  
SPEEDER—Full Revolving Shovels, Draglines  
EMPIRE—Cutting Edges, Wheelbarrows, Carts  
EUCLID—Crawler Dump Wagons, Power Scrapers  
ATLAS—Rotary Wheel-type Scrapers, Fresno  
JAEGER—Mixers and Pumps  
LAKEWOOD—Finishers, Sub-grading Machinery  
BLAW-KNOX—"Ball" Wagon Graders

**Arizona Tractor & Equipment Co.**

238 W. Jefferson St. Phoenix, Ariz.

#### Representing

"CATERPILLAR" Tractors  
"CATERPILLAR" Road Machinery  
ATHEY Truss Wheels  
BUFFALO-SPRINGFIELD Rollers  
HEIL Hoists  
KILLEFER Road Tools  
LAPLANT-CHOATE Snow Plows  
LITTLEFORD Asphalt Equipment  
SPEEDER Shovels  
WILLAMETTE-ERSTED Hoists  
EUCLID Earth Moving Equipment  
ATECO Bulldozers and Scarifiers

**ARKANSAS FOUNDRY COMPANY**  
IRON AND STEEL

Little Rock Arkansas

#### Representing

AMERICAN STEEL & WIRE CO.—Wire Rope and Cable  
NATIONAL STEEL FABRIC CO.—Wire Mesh  
MILWAUKEE CORRUGATING CO.—Lath and Building Products  
MAJESTIC CO.—Coal Chutes and Building Products  
IRVING IRON WORKS—Subway Grating  
CARTER BLOX-ON-END FLOORING CO.—Industrial Wood Flooring  
Also  
Structural and Reinforcing Steel and Steel Building Products

**The Young & Vann Supply Co.**  
BIRMINGHAM, ALA.

Koehring Pavers, Mixers, Cranes, Shovels, etc.  
Insley Chutes, Towers, Shovels, Cranes, etc.  
Parsons Ditchers, Backfillers  
Smith Concrete Mixers and Pavers  
Novo Hoists, Pumps  
Huber Road Rollers  
Blaw-Knox Forms, Batcher Plants, Buckets  
Easton Dump Bodies, Cars and Trucks  
Worthington Pumps and Air Compressors  
Rex-Watson Dump Wagons  
Red Edge Shovels and Picks  
General Wheelbarrows  
M. & M. Form Clamps  
Carey Elastic Expansion Joint  
Ord Concrete Finishing Machines  
Beebe Bros. All Steel Hand Hoists  
Metalweld Portable Compressors

**NEIL B. MCGINNIS CO.**

753 E. Jackson St. Phoenix, Ariz.

#### Representing

Allis-Chalmers Monarch Tractors  
Brennells Rippers & Scarifiers  
Butly Back Fillers & Bulldozers  
Erie Road Rollers  
General Shovels, Cranes, etc.  
Gardner-Denver Portable Compressors, Jack Hammers, etc.  
Goroco Spreaders  
Huber Road Rollers  
Jaeger Concrete Mixers, Pavers, Pumps, Hoists  
Jumbo Wheel Scrapers  
Lima 101 Shovels  
Madson Portable Paving Plants  
Master Rotary Scrapers  
Milwaukee Gas Locomotives  
Pioneer Crushing, Screening and Loading Plants  
Serviced Expansion Joint  
Snow King Rotary Snow Plows  
Williamsport Wire Rope and Aerial Tramways

**ARKANSAS TRACTOR & EQUIPMENT COMPANY**

424 East Third St., Little Rock, Ark.

#### Representing

CATERPILLAR TRACTOR CO.—Tractors, Graders and Combines  
AMERICAN TRACTOR EQUIP. CO.—Dirtmovers, Bulldozers, Tampers  
EUCLID CRANE & HOIST CO.—Wagons and Scrapers  
ATHEY TRUSS WHEEL CO.—Wagons  
LA PLANTE-CHOATE MFG. CO.—Wagons and Bulldozers  
PIONEER GRAVEL EQUIP. CO.—Crushing, Loading, Screening Plants  
SPEEDER MACHINERY CO.—Shovels  
KILLEFER MFG. CO.—Contractors and Agricultural Equipment  
TOWERS & SULLIVAN MFG. CO.—Plows and Farm Tools  
ATLAS SCRAPER CO.—Scrapers  
WILLAMETTE-ERSTED CO.—Winches

For Canadian Distributors, see pages 193 and 194

### J. B. HARBISON EQUIPMENT CO.

209 Spring St. Little Rock, Ark.

#### Representing

NORTHWEST Shovels and Draglines  
CHICAGO AUTOMATIC Conveyors  
RYAN Power Graders and Dual Blade Motor Patrols  
WILLIAMS Clamshell and Dragline Buckets  
HELTZEL Bias Weighing Hoppers & Road Forms—Curb, Gutter & Sidewalk Forms  
GENERAL EXCAVATOR CO. Shovels and Cranes  
WIARD Plows & Grade Rooters  
LUEBINGHAUS Dump Wagons  
AUSTIN Trenchers & Backfillers  
TOLEDO Torches  
CARBIC Flood Lights  
REPUBLIC Concrete Mixers  
UNION Steam Hammers  
GOOD ROADS Crushers & Asphalt Distributors

### COAST MACHINERY CORP.

Ed. Crowley, Pres.

931 Santa Fe Ave., Los Angeles, Calif.  
310 Fourth St., San Francisco, Calif.

#### Representing

CLIMAX ENGR. CO.—Industrial Gas Engines  
CURTIS PNEUMATIC MACHINERY CO.—Compressors, Hoists, Trolleys  
CUSHMAN MOTOR WORKS—Gas Engines  
UNIVERSAL MOTOR CO.—Gas Engines  
CONCRETE SURF. MACHY. CO.—Concrete surfacers and Finishers. (L. A. Territory)

### GARLINGHOUSE BROS.

2044 Santa Fe Ave., Los Angeles, Cal.  
Southern California Distributors for

Blaw-Knox Co.—Steel Forms, Road Building Equipment  
A. W. French & Co.—ORD Road Finishers  
Browning Crane Co.—Shovels, Cranes  
Domestic Eng. & Pump. Co.—Road Builders and Dewatering Pumps  
Ransome—Concrete Placing Equipment  
Smith Engineering Works—Crushers and Gravel Plant Equipment  
The Knickerbocker Co.—Concrete Mixers, Saw Rigs  
Alex. Milburn Co.—Carbide Lights, Cutting and Welding Torches  
A. Leichen & Sons Rope Co.—Wire Rope  
McKier nan-Try Corp.—Pile Hammers and "National" Hoists  
Black & Decker—Electric Saws and Drills  
Member: Associated Equipment Distributors

### WE WOULD LIKE TO HAVE YOU HELP US

make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue New York

### CONCRETE MACHY. & SUPPLY CO.

777 E. Gage Ave. Los Angeles, Calif.

#### Representing

AMERICAN Cable  
ARCHER Towers & Chuting  
BUTLER Bins & Batches  
BUCYRUS-ERIE Shovels and Cranes  
BLYSTONE Products Mixers  
CLYDE Hoists & Derricks  
GARDNER-DENVER Compressors  
HANDY Sack Cleaners and Balers  
TRACKSON Crawlers, Shovels  
Member: Associated Equipment Distributors  
HOMELITE Pumps and Generators  
HOTCHKISS Road Forms  
LE ROI Engines  
PARSONS Excavating Mch.  
REX Mixers and Pavers  
RED STAR Wheelbarrows and Carts  
SERVICISED Expan. Joints  
STEARN'S Elev. & Conveyors  
WILLIAMS Buckets

### B. HAYMAN CO., Inc.

118-128 N. Los Angeles St. Los Angeles, Cal.

#### Representing

ALLIS-CHALMERS MFG. CO.—Agricultural & Industrial Tractors  
BAKER MFG. CO.—Backfillers & Road Equipment  
ATLAS SCRAPER CO.—Rotary Wheeled Scrapers & Power Scrapers  
W. M. BLAIR MFG. CO.—Hydraulic Loaders & Bulldozers  
BROOKVILLE LOCOMOTIVE CO.—Locomotives  
HUGHES-KEENAN CO.—Revolving Portable Cranes  
RUCKSTELL DISTRIBUTING CO.—Ruckstell Dual High Transmissions  
SCHRAMM INC.—Air Compressors  
DETROIT HARVESTER CO.—Street Sweepers & Mowing Machines  
TRACKSON CO.—Crawler Tractors, Hoists, and Loaders  
WEHR CO.—Motor Graders & Pull Graders  
WILLAMETTE-ERSTED CO.—Portable Hoists  
W-K-M INC.—Oil Field Equipment

### KERN—LIMERICK, Inc.

115 No. Spring St. Little Rock, Ark.

#### Representing

STOCKLAND Graders, Small Road Tools  
KOEHRING Pavers, Shovels, Cranes  
T. L. SMITH Mixers and Pavers  
INSLEY Mast Hoists, Building Towers  
PARSONS Excavators and Backfillers  
C. H. & E. Pumps, Saw Tanks and Hoists  
CLEVELAND Rock Drills, Air Tools, Etc.  
RESILIFLEX Guard Rail  
ELLCOTT Dredges and Dredging Machinery  
HUBER Road Rollers  
CEDAR RAPIDS Crushers, and Gravel Plants  
SIDNEY Steel Scrapers, Wheelbarrows, Tools  
SCHRAMM Air Compressors, Drills, Tools, Etc.  
WICKWIRE-SPENCER Wire Mesh and Cables  
CONNEAUT Hand Shovels, Cutting Edges for all makes of Graders  
MONARCH Tractors  
LITTLEFORD Asphalt Heaters and Equipment  
TRACKSON Crawlers, Hoists

### CROOK COMPANY

1220 South Grand Ave. Los Angeles, Calif.

#### Southern California Distributors

Allis Chalmers —Monarch Tractors  
Rome Manufacturing Co. —Graders  
Master Equipment Co. —Scrapers, Backfillers  
Davis Manufacturing Co. —Hydraulic Scraper  
Brennels Company —Scarifiers, Road Rippers, Implements  
Osgood Company —Shovels, Cranes, Hoists  
Buffalo-Springfield Co. —Rollers  
Ransome Concrete Machy. Co. —Pavers, Mixers, Towers  
W. R. Meadows Company —Expansion Joints  
Heltzel Steel & Iron Co. —Bins, Batches, Road Forms  
Novo Engine Company —Engines, Hoists, Pumps

### SHEPHERD TRACTOR AND EQUIPMENT COMPANY

514-20 West 12th St. Los Angeles, Calif.

#### Representing

"CATERPILLAR" Tractors  
"CATERPILLAR" Road Graders  
KILLEFER Scrapers, Scarifiers, Road Discs  
ATECO Dirt Movers, Bulldozers  
ATHEY Truss Wheel Trailers  
BAKER MANEY Scrapers  
LaPLANT-CHOATE Crawler Wagons  
MASTER Backfillers, Pipe Line Equipment

### JOE LYONS MACHINERY CO.

Contractors' Equipment and Supplies  
112 Louisiana St. Little Rock, Ark.

#### Representing

REX—Mixers and Pavers, Mortar and Plaster Mixers, Pumps and Saw Rigs  
BLAW-KNOX—Curb, Gutter and Road Forms, Batches, Bins, Clamshell Buckets, Truck Turntables  
RED STAR—Wheelbarrows, Concrete Carts  
SKELTON—Shovels  
BUCYRUS-ERIE—Power Shovels, Cranes and Draglines  
LIDGERWOOD—Hoists, Derricks  
NOVO Hoists, Etc.  
MORROW—Gravel Screening and Washing Plants  
INGERSOLL RAND—Compressors, Drills, etc.  
TRU-LAY—Wire Rope  
WAUKESHA—FULLER & JOHNSON—LEROI—Engines  
BATES—Bar Ties

Also anything else a contractor uses

### E. I. CROOK COMPANY

1222 So. Grand Ave., Los Angeles, Cal.

#### Representing

GENERAL—Shovel, Cranes, Draglines  
MORTON—Scrapers, Dirt Movers  
D-A Lubricants

### SMITH BOOTH USHER CO.

Los Angeles

1910 Santa Fe Ave. 228-238 Central Ave.

BARBER-GREENE—Ditchers, Excavators, Loaders  
CARBIC—Portable Lights  
CEDAR RAPIDS—Crushing Plants  
EASTON—Industrial Cars  
FREEMAN—Turntables  
GALION—Graders, Rollers  
HERCULES—Power Units  
JAEGER—Mixers, Hoists, Pumps, Tower Equipment  
JOHNSON—Bins, Four Wheel Drive Trucks  
LAKEWOOD—Road Finishers, Forms, Chuting, etc.  
Member: Associated Equipment Distributors  
LE ROI—Gasoline Engines  
METALWELD—Compressors  
MOHAWK—Asphalt Heaters  
MOWWHITE—Wire Rope  
MULTI-FOOTE—Pavers  
MUNDY—Hoists  
INDIANA—Hand Shovels  
SAUERMAN—Cableway Excavators, Power Drag Scrapers  
SIMPLEX—Trench Braces  
JACKSON—Wheelbarrows  
THEW—Shovels and Cranes  
UNIVERSAL—"35" Shovels and Cranes  
SKILSAW—Portable Electric Saws

### The BROWN-BEVIS CO.

49th St. & Santa Fe Ave. Los Angeles, Cal.

#### Distributors

J. D. Adams and Co.—Adams Lanning Wheel Graders  
Sullivan Machy. Co.—Compressors, Hoists  
Wood Shovel & Tool Co.—Wood Molybdenum Shovels  
Milwaukee Locomotive Works—Gasoline Locomotives  
Continental Motors Corp.—Gasoline Engines  
Geo. Hales Mfg. Co.—Truckloaders and Conveyors  
Barnes Mfg. Co.—Barnes Pumps  
The Owen Bucket Co.—Clam Shell Buckets  
Buckeye Traction Ditcher Co.—Curo & Trench Ditchers  
Northwest Engr. Co.—Shovels, Cranes, Draglines  
Construction Machy. Co.—Welder and Marsh-Capron Cement Mixers  
Huber Mfg. Co.—Road Rollers  
Page Engineering Co.—Dragline Buckets  
Littleford Bros.—Tar and Asphalt Heaters, etc.  
Member: Associated Equipment Distributors

### WE DO NOT CHOOSE TO RUN—

anything in this Directory that is not accurate and up-to-date. Therefore, if you find any errors or corrections we hope you will let us know about them. Thank you.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave. New York

### OWEN BUCKET CO., Ltd.

627 Hannah Street Oakland, Calif.

#### Representing

THE OWEN BUCKET CO.  
Clamshell Buckets  
DRAKE, WILLIAMS, MOUNT CO.  
Dragline Buckets



# **CORNELL TRACTOR COMPANY**

10 Abbott St., Salinas, Calif.

**Branches:**  
Watsonville      Soledad      King City

## **Distributors:**

"Caterpillar" Tractors  
"Caterpillar" Combines  
"Caterpillar" Graders  
John Deere Implements  
Killefer Manufacturing Corporation  
Farm Implements & Road Machinery  
"ATECO" Road Machinery  
Reo Trucks

# **KRATZ & McCLELLAND, Inc.**

522 Bryant St. San Francisco, Calif.

Northern California Distributors

Ransome Concrete Machy. Co.—Pavers, Mixers, Towers, Chuting  
Novo Engine Co.—Engines, Hoists, Pumps, Lighting Units  
Chausse Oil Burner Co.—Portable Asphalt Plants, Kettles, Surface Heaters  
Greyhound—Contractors Portable Saws  
Milwaukee Locomotive Co.—Gasoline Locomotives  
Diamond Iron Works, Inc.—Gravel & Rock Crushing Plants  
G. H. Williams Co.—Clam Shell & Drag Line Buckets and Heavy-Duty Trailers  
Heltzel Steel Form & Iron Co.—Bins, Batchers & Road Forms  
Ames Iron Works—Gasoline Road Rollers  
Union Iron Works, Inc.—Pile Hammers & Foundation Equip.  
Bartlett & Snow—Concrete Truck Bodies  
Greiman Ditcher Co.—Ditchers and Trench Supporters  
Fischer & Hayes Rope & Steel Co.—Concrete Form Devices  
N. P. Nelson Iron Works—Loaders & Conveying Equipment

# **Headrie & Bolthoff Mfg. & Supply Co.**

Established 1861

1635 Seventeenth St. Denver, Colo.

## **Representing**

AMERICAN—Contractors Saw Tables  
AMERICAN—Hoists and Derrick  
BARBER ASPHALT CO.—Roofing and Asphalt Products  
BEEBE BROS.—Hand Winches  
BOSS—Concrete Mixers  
CLIMAX—Gasoline Power Units  
GARDNER-DENVER—Pumps, Air Compressors and Drills  
GENERAL ELECTRIC—Motors and Appliances  
NOVO—Engines and Hoists  
ROEBLING—Rope and Wire  
SKILSAW CORP.—Skilaws  
UNIVERSAL—Crushers  
WYOMING—"Red Edge" Shovels

# **EDWARD R. BACON CO.**

CONSTRUCTION EQUIPMENT

Folsom at 17th St.

San Francisco

Adams Leasing Wheel  
Graders  
Burch Stone Spreaders  
Byers Shovels and Cranes  
Carr Subgraders  
Cedar Rapids Crushers  
Cleveland Trenchers  
Easton Industrial Cars  
Hercules Power Units  
Homelite Pumps  
Huber Rollers  
Jager Concrete Mixers  
Johnson Bins and Batchers  
Schramm Air Compressors  
Member: Associated Equipment Distributors

Madsen Asphalt Plants  
McCormick-Deering Industrial Tractors  
McKiernan-Terry Pile Hammers  
MultiFoote Road Pavers  
Northern Conveyors  
Ord Road Finishers  
Schramm Air Compressors  
Templeton Kelly Jacks and Trench Braces  
Toledo Torches and Hoses  
Trackson Crawler Tractors  
Dobbie Winches  
Member: Associated Equipment Distributors

# **LOOK THIS DIRECTORY OVER CAREFULLY**

If you find any errors while checking over this directory will you please advise us at once, because it is our desire to keep it accurate and up-to-date at all times.

CONTRACTORS AND ENGINEERS  
MONTHLY

470 Fourth Ave. New York

# **H. W. MOORE EQUIPMENT CO.**

6th & Acome Streets

Denver, Colorado

## **Representing**

BATES Tractors  
BUTLER Bins  
GALION Graders, etc.  
JAEGER Concrete Mixers  
GENERAL EXCAVATOR  
Shovels, Cranes, Etc.  
STROUD Elevating Graders  
BAKER Maintainers, Plows  
ETNYRE Sprinklers & Others  
LAKEWOOD Concrete Handling Equipment  
WHITCOMB Locomotives  
WEHR One-Man Graders  
CHAUSSE Asphalt Heaters  
TRACKSON Crawlers  
Member: Associated Equipment Distributors

SASGEN Derrick  
INTERNATIONAL Tractors  
SIDNEY Scrapers and Wheelbarrows  
UNIVERSAL Cranes  
ERSTED Hoists  
THEW Shovels  
SCHRAMM Compressors  
CLEVELAND Rock Drills  
HOMELITE Pumps  
CEDAR RAPIDS "Pre-Mix" Oil Plants, Crushers, Etc.  
TRAILMOBILE Trailers  
HUGHES-KEENAN Iron Mules

# **NORRIS K. DAVIS, INC.**

400 Seventh St. San Francisco, Calif.

## **Representing**

LE ROI CO.—Gasoline Power Units  
MINNEAPOLIS STL. & MACHY. CO.—Twin City Engines  
ARCHER IRON WORKS—Concrete Placing Equipment  
CLEVELAND WHEELBARROW CO.—"Red Star" Wheelbarrows  
RUSSEL SHOVEL CO.—Hand Shovels  
DAVIS CO.—Mixers, Hoists, Motor Truck Concrete Transfer Systems

# **ELTON T. FAIR CO.**

1611 Wazee St. Denver, Colo.

## **Representing**

J. D. Adams Co.  
Pioneer Gravel Equip. Mfg. Co.  
D-A Lubricant Co., Inc.

# **HERBERT N. STEINBARGER CO.**

Construction Equipment

1640-1646 Wazee St. Denver, Colo.

## **Distributors**

BUCYRUS-ERIE Steam, Gas, Diesel and Electric Shovels, Draglines and Cranes  
VULCAN Steam and Gasoline Locomotives  
BUTLER Bins and Hoppers  
SAUERMAN Power Scrapers, Cableway Excavators  
AUSTIN Trenching Machines, Backfillers  
METAFORM Sidewalk, Curb and Road Forms  
KNICKERBOCKER Concrete Mixers  
MULY-FOOTE Paving Mixers  
WILLIAMS Buckets  
BUFFALO-SPRINGFIELD Steam and Gasoline Rollers  
RYAN-EDWARDS Road Machinery  
BUHL Portable Compressors  
HARDSOCC Drills and Pavement Breakers  
Member: Associated Equipment Distributors

# **GARFIELD & CO.**

Construction Equipment

Hearst Building San Francisco, Calif.

## **Representing**

PLYMOUTH—Gasoline and Diesel Locomotives  
LINK-BELT—Shovels, Draglines and Cranes  
AUSTIN—Trenchers and Backfillers  
BAY CITY—Shovels, Cranes, Draglines and Cranes  
CLYDE—Hoists and Derrick  
INSLEY—Chuting Plants for Dams  
LEACH—Mixers, Pavers, Saw Rigs  
ERIE—Buckets and Aggregators  
ROLLER-BEAR—Rock Crushers

# **JOHN W. FINK COMPANY**

1645 Wazee Street Denver, Colo.

## **Representing**

ROME MFG. CO.—Graders  
DUPLEX MFG. CO.—Road Maintainers  
SPEEDER MACHY. CO.—Gas Shovels, Cranes, Draglines, Skimmers  
HUBER MFG. CO.—Gas Rollers  
DAVIS MFG. CO.—Land Levelers

# **SPROTT TRACTOR & EQUIP. CO.**

150 W. Main St., Grand Junction, Colo.

## **Representing**

Caterpillar Tractor Co.  
Killefer Mfg. Co.  
LaPlant-Choate Mfg. Co.  
Williamette-Ersted Co.  
Oliver Farm Equip. Sales. Co.  
Athey Truss Wheel Co.  
Lansing Mfg. Co.  
W-K-M Co., Inc.

# **JENISON MACHINERY CO.**

58 Fremont St., San Francisco, Calif.

## **Representing**

Barber-Greene Co.  
Butler Bin Co.  
Carbic Mfg. Co.  
Carter Humdingery Pumps  
Chicago Pump Co.  
Continental Motors Corp.  
The Elgin Corporation  
Gallen Iron Wks. & Mfg. Co.  
Hercules Corporation  
Lakewood Engineering Co.  
Member: Associated Equipment Distributors

McCloskey Torch Co.  
Morris Machine Works  
J. S. Mundy Htg. Engine Co.  
Orton Crane & Shovel Co.  
Sauerman Bros., Inc.  
Smith Engr. Works  
Sterling Pump Works  
Thew Shovel Co.  
Watt Car & Wheel Co.  
Wilson Welder & Metals Co.

*Paul H. General*  
INDUSTRIAL & CONSTRUCTION  
EQUIPMENT

U. S. National Bank Building, Denver, Colo.

P & H. Shovels, Cranes, Draglines, Trench Machines  
NORTHERN Portable and Stationary Conveyors  
PLYMOUTH Gasoline and Diesel Locomotives  
ARCHER Steel Tower & Concrete Distributing Systems  
OWEN Clamshell Buckets  
OHIO Locomotive Cranes  
ERIE Aggregator Plants  
McKIERMAN-TERRY Pile Hammers  
GRUENDLER Crushing and Screening Plants  
HIGHWAY 2-4-0-8 Wheel Trailers  
PAGE Dragline Buckets

# **THE HOLMES-TALCOTT CO.**

HARTFORD

CONNECTICUT

## **Representing**

SPEEDER—Shovels and Cranes  
LEACH—Concrete and Plaster Mixers, Mast Hoists and Saw Rigs  
METALWELD-WORTHINGTON—Portable Air Compressors  
CLEVELAND—Rock Drills  
ERIE—Aggregators, Bins and Buckets  
METAFORM—Steel Road Forms  
HAISS—Loaders and Conveyors  
AUSTIN-WESTERN—Road Machinery  
CLYDE Hoists  
CARTER—Pumps  
HIGHWAY—Trailers  
BEAUMONT—Blackline Cableway and Drag Scraper Systems  
Equipment for Contractors

**The K. B. NOBLE CO.**

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REPRESENTING AMONG OTHERS

Flex Mixers	Hercules Engines
Heltzel Bins & Batters	LaRoi Engines
Lawrence Pumps	Smith Crushers, etc.
Saugen Derricks	Easton Cars, etc.
Sullivan Compressors	Garet Scrapers
Box Hoists	Owen Buckets
National Hoists	Byers Shovels
Link-Belt Loaders	Cranes, Conveyors

Member:  
Associated Equipment Distributors

**HARTFORD, CONNECTICUT**

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**JULIEN P. BENJAMIN INC.**

21 N. Ocean St. Jacksonville, Fla.

*Representing*

McKiernan-Terry Corporation  
Barber-Greene Co.  
Aerofil Burner Co.  
Sauterman Bros., Inc.  
Link Belt Co.  
Heltzel Steel Form & Iron Co.  
Standard Conveyor Co.  
Dixoy, Incorporated  
National Colortype Co.  
Huber Rollers  
Climax Engineering Co.  
National Hoisting Engines  
Bay City Cranes

**LLEWELLYN MACHINERY CORP.**

Miami Representing Florida

American Saw Mill Machy. Co.  
Archer Iron Works  
Atlas Imperial Diesel Eng. Co.  
Barber-Greene Co.  
Blystone Mfg. Co.  
Chicago Pneumatic Tool Co.  
Cleveland Tractor Co.  
Consolidated Conc. Mch. Co.  
Denver Rock Drill Mfg. Co.  
Electric Welding Co.  
Engberg's Elec. and Mech-  
anical Works  
Erie Steel Constr. Co.  
Foots Co.—Pavers  
Hercules Corp.  
Independent Pneu. Tool Co.

Jaeger Machine Co.  
Jeffrey Mfg. Co.  
Wm. H. Keller, Inc.  
Mathews Conveyor Co.  
Metal Form Co.  
Northwest Eng. Co.  
Novo Engine Co.  
Page Engineering Co.  
Pioneer Mfg. Co.  
Oliver Farm Equip. Sales Co.  
Rocheater Can Co.  
Rumsey Pump Co.  
Saugen Derrick Co.  
Schramm, Inc.  
Worthington Pump & Machinery Co.

**THE GESNER EQUIPMENT CORP.**

254 Park St. New Haven, Conn.

*Representing*

Jaeger Machine Co.  
Northern Conveyor & Mfg. Co.  
Domestic Engine & Pump Co.  
De Walt Products Co.  
Schramm, Inc.  
Cleveland Rock Drill Co.  
Marion Steam Shovel Co.  
Beaumont Mfg. Co.  
Universal Road Machinery Co.

**FARQUHAR MACHINERY CO.**Mill Supplies and Machinery  
720 W. Bay Street Jacksonville, Fla.*Representing*

AMERICAN  
ARCHER  
CARBIC  
CRESCENT  
FARQUHAR  
GOULDS  
JACKSON  
LINK-BELT  
NOVO  
NOVO  
NOVO  
SARGEN  
SILVERSTRAND  
TOLEDO  
STRUCTURAL STEEL

"BOSS" Concrete Mixers  
Concrete Tower Equipment  
Flare Lights, Welding Equipment  
Saw Tables and Woodworkers  
Engines and Boilers  
Power Pumps  
Wheelbarrows, Concrete Carts  
Chains, Sprockets, Drives  
Gasoline Engines  
Hoists, Single and Double Drum  
Power Diaphragm & Road Pumps  
Derrick Equipment  
Wire Rope and Accessories  
Steel Torch Lights  
Plain and Fabricated

**D. E. FISHBACK**

ORLANDO Distributor FLORIDA

Fairbanks-Morse & Co., Oil Engines, Pumping Machinery  
Electric Motors, Home Light and Water Plants  
Jaeger Machine Co. Concrete Mixers, Road and Trench  
Pumps, Hoists, Etc.  
Cincinnati Rubber Co., Dredging Sleeves, Section and  
Discharge Hose  
American Saw Mill Mach. Co., Portable Woodworkers,  
Saw Benches, etc.  
Gould's Pumping Inc., Power, Diaphragm and Hand Pumps  
Cement Block Mach. Co., "National" Concrete Block  
Machines  
Chicago Pneumatic Tool Co., Portable and Stationary Air  
Compressors, Lift Pumps, Pipe, Valves and Fittings  
STOCK CARRIED IN ORLANDO

**Power Equipment & Service Inc.**109 Water Street New Haven, Conn.  
CONN. DISTRIBUTORS

COLDWELL Power Mowers  
RODERICK LEAN Scrapers  
GALION Road Machinery  
OLIVER Implements  
SARGENT and WALSH Snow Plows  
CLETRAC Crawler Tractors  
HART-PARR Tractors  
MARLO Pumps  
DETROIT Street Sweepers  
CHICAGO Pneumatic Compressors

**M. D. MOODY**ACL No. 2—Sect. 1. Riverside Viaduct  
Jacksonville, Florida*Representing*

J. D. Adam & Co.  
American Casting Co.  
American Mfg. Co.  
American Tar Products Co.  
Buffalo-Springfield Roller Co.  
Cyclone Fence Co.  
The Elgin Corporation  
E. D. Emyre & Co.  
Domestic Engine & Pump Co.

De Walt Products Co.  
Chas. Hyatt Co.  
Littleford Brothers  
Lakewood Engineering Co.  
Mead-Morrison Mfg. Co.  
Rawls Mfg. Co.  
Freuhof Trailer Co.  
Freeman Mfg. Co.

**MCDONALD TRACTOR EQUIP. CO.**

2303 N. Orange Ave. Orlando, Fla.

*Representing*  
Caterpillar Tractor Co.  
"Caterpillar" Graders  
Athey Truss Wheel Co.  
Barnes Manufacturing Co.  
Blaw-Knox Company  
P & H Cranes  
LaPlant-Choate Mfg. Co.  
Detroit Harvester Co.  
Chain Belt Co.  
Fate-Roth-Heath Co.  
Fuller & Johnson Mfg. Co.  
Killefer Manufacturing Corp.  
Le Roi Company  
Goulds Pumps, Inc.  
Stover Engines  
Century Motors  
Member: Associated Equipment Distributors

**Hudson Supply & Equipment Co.**

7th &amp; T Sts., NE. Washington, D. C.

*Representing*

HELTZEL STEEL FORM & IRON CO.—Road  
Forms, Curb and Gutter Forms, Bins,  
Batches  
N. P. NELSON IRON WORKS, INC.—Loaders  
CONCRETE SURFACING MACHINERY CO.—  
"Berg" Concrete Surfacers  
CHAIN BELT CO.—Mixers, Hoists, Pumps  
SARGEN DERRICK CO.—Derricks, Winches  
NOVO ENGINE CO.—Hoists, Pumps, Engines  
NATIONAL BRAKE & ELECTRIC CO.—Air  
Compressors

Member: Associated Equipment Distributors

**CONTRACTORS EQUIPMENT CO.**

2150 N. W. 1st Court Miami, Fla.

*Representing*

INGERSOLL-RAND Compressors  
REX Mixers, Pavers, Chain  
BLAW-KNOX Steel Forms, Batches  
JONES-SUPERIOR Super Woodworkers  
LANSING Hoists  
BARNES Pumps  
ORD Concrete Road Finishers  
STREET BROS. Hoist and Derrick Fittings  
SYNTRON Electric Hammers  
NORTHERN Conveyors  
LE ROI Engines  
ESSICK Plaster Mixers

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Cyclone Fence Co. Smith Engineering Works  
Dixoy, Inc. Sterling Wheelbarrow Co.  
Littleford Bros. Clyde Iron Works  
Member: Associated Equipment Distributors

**ROY C. WHAYNE SUPPLY CO.**  
8th and Main Streets  
LOUISVILLE, KY.

“CATERPILLAR” Tractors  
“CATERPILLAR” Road Machinery  
JAEGER Concrete Mixers  
HELTZEL Steel Forms  
BARNES Pumps  
SULLIVAN Compressors, Drills, etc.  
CHICAGO AUTOMATIC Conveyors  
CONSTRUCTION EQUIP. OF ALL KINDS  
Member: Associated Equipment Distributors

**JOE C. TUCKER**  
Morganfield Kentucky

*Representing*  
J. D. Adams Co.  
Cleveland Tractor Co.  
Western Wheeler Scraper Co.  
Harnischfeger Corporation  
Lakewood Engineering Co.  
E. D. Etnyre & Co.  
Metalweld, Inc.  
A. B. Farquhar, Ltd.  
Chain Belt Co.

**HENRY A. PETTER SUPPLY CO.**  
Paducah Kentucky

*Representing*  
American Wire Rope, Mesh  
Archer Tower Equip.  
Austin Western Road Mach'y  
Bates Bar Ties  
Berg Surfaces and Finishers  
Ted Carr Road Rooters  
Chattanooga Wheelbarrows  
Chain Belt (Hex) Mixers  
Caldwell Tanks, Towers  
DuPont Explosives  
Dobbie Derricks  
Dietz Lanterns  
Farquhar Engines, Boilers  
Hauck Heaters and Thawers  
Fruehauf Trailers  
Johnson Bins and Hoppers  
Lidgerwood Hoisting Machy.  
D. A. Lubricants  
Link-Belt Portable Conveyors  
Le Roi Gas Engines  
Northwest Shovels, Cranes  
Novo Pumps and Hoists  
Page Buckets  
Pulsometer Steam Pumps  
Servicised Expansion Joint  
Templeton-Kenly Jacks  
Toledo Torches  
Universal Con. Accessories  
Vulcan Pipe Equipment  
Westinghouse Electric Motors  
Worthington Pumps, Compressors  
Wyoming Shovels

**EASTON TRACTOR AND EQUIPMENT COMPANY**  
2025 Lower Third St. Alexandria, La.

*Representing*  
CATERPILLAR TRACTOR CO.—“Caterpillar” Tractors and Road Machinery  
SPEEDER MACHINERY CORP.—Cranes, Shovels and Draglines  
ATLAS SCRAPER CO.—Rotary Scrapers  
WILLAMETTE-ERSTED CO.—Tractor Hoists  
Also  
A complete line of Tractor Farming Implements and Tractor Appliances

**FLETCHER EQUIP. CO., INC.**  
309 Magazine Street New Orleans, La.

*Representing*  
ARCHER Towers and Chuting Equipment  
BARBER-GREENE Loaders, Conveyors, Ditchers  
BUTLER Bins, Batches  
CLYDE Hoisting Engines and Derricks  
FREEMAN Turntables  
HUG Subgraders, Trucks  
LE ROI Gas Engines  
LINK-BELT Draglines, Cranes and Shovels  
M & M Form Clamps  
McLEOD Asph. Heaters  
BAY CITY Truck Cranes  
OWEN Clamshell Buckets  
OMAHA Dragline Buckets  
REX Mixers, Pavers, Pumps and Saw Rigs  
SAUERMAN Cableway Excavators  
STERLING Wheelbarrows and Carts  
SULLIVAN Air Tools and Compressors  
SIMPLEX Trench Braces and Jacks  
TOLEDO Torches  
WOOD Molybdenum Steel Shovels  
Member: Associated Equipment Distributors

**EQUITABLE EQUIPMENT CO. Inc.**  
410 Camp St. New Orleans, La.

*Representing*

ACME Road Graders, Rollers, Etc.	KOPPEL Industrial Cars
BROWNING Cranes	LAKEWOOD Mixers, Towers
BURY Stationary Air Compressors	MERRELL Pipe Machines
CLIMAX Engines	MORRIS Dredges, Pumps
DEAN BROS. Pumps	NORTHERN Cranes
DEAN HILL Centrifugal Pumps, Turbines	NOVO Engines, Hoists and Pumps
FLORY Hoists	NAGLE Boilers
GENERAL ELECTRIC Arc Welders, Motors	PACIFIC Deep Well Pumps
INGERSOLL-RAND Air Compressors, Tools	PLYMOUTH Locomotives
INTERNATIONAL Nickel, Mamel	STEPHENS-ADAMSON Conveyors, Etc.
	WEIR-KILBY Frogs and Switches
	Welded Tanks, Pipe, Etc.

**SOUTHERN STATES EQUIP. CO., Inc.**  
1510-1530 Tchoupitoulas St. NEW ORLEANS

*Representing*

P & H—Shovels, Cranes and Draglines  
BLAW-KNOX—Bins, Batchers, Road Formas.  
Buckets  
OED—Concrete Finishing Machines  
FOOTE—Paving Mixers  
JAEGER—Concrete Mixers  
TELSMITH—Sand and Gravel Plants  
DOMESTIC—Pumps, Engines  
OER & SEMBOWER—Hoisting Engines  
LAKEWOOD—Concrete Chuting  
UNION—Pile Hammers  
THOR—Compressors and Air Tools  
KOPPEL—Industrial Cars and Trucks  
STANDARD—Heating Kettles  
CONTINENTAL—Gas Engines  
CHICAGO—Automatic Material Conveyors

**NORTHERN ROAD EQUIPMENT CO.**  
82 St. John Street, Portland, Maine

*Representing*

FOUR WHEEL DRIVE AUTO CO.—"FWD" Trucks  
MAINE STEEL PRODUCTS CO.—"Sargent" Snowplows  
INTERNATIONAL HARVESTER CO.—Industrial Tractors  
WEHR CO.—Power Road Graders  
TRACKSON CO.—Crawlers, Bulldozers, Loaders  
BAY CITY SHOVELS, INC.—Shovels, Cranes  
SCHRAMM, INC.—Compressors  
N. P. NELSON IRON WORKS—Loaders  
HUGHES-KEENAN CO.—Cranes, Iron Mules

**LOOK THIS DIRECTORY OVER CAREFULLY**

If you find any errors while checking over this directory will you please advise us at once, because it is our desire to keep it accurate and up-to-date at all times.

**CONTRACTORS AND ENGINEERS MONTHLY**

470 Fourth Ave. New York

**WORMINGTON & POWERS, Inc.**  
601 Southern Bldg. New Orleans, La.

*Representing*

LITTLEFORD BROS. CO.—Tar & Asphalt Heaters, Road Builders' Supplies	MEAD-MORRISON MFG. CO.—Steam, Gas & Electric Hoists & Car Pullers, Full Swing Crawler Cranes
THE KNICKERBOCKER CO.—Concrete & Mortar Mixers, Saw Rigs	MUNDIE MFG. CO.—Gas & Electric Air Compressors
OSGOOD CO.—Steam, Gas, Electric Cranes, Shovels, Draglines, etc.	METAL FORMS CORP.—Building, Gutter, Curbs, Sidewalk & Road Forms
W. A. RIDDELL CO.—Road Building Machinery	SAGEN DERRICK CO.—Derricks for all purposes

**ALBAN TRACTOR COMPANY, Inc.**  
821-23 East 25th St. Baltimore, Md.

*Representing*

CATERPILLAR TRACTOR CO.  
"CATERPILLAR" ROAD MACHINERY  
"CATERPILLAR" COMBINE HARVESTERS  
GENERAL EXCAVATORS  
KILLEFER TILLAGE TOOLS  
LINK-BELT SHOVELS & CRANES  
EUCLID CRANE & HOIST CO  
LA PLANT-CHOATE MFG. CO.  
WILLAMETTE-ERSTED CO.  
BAKER MANUFACTURING CO.  
ROTARY SNOW PLOW CO.  
ATHEY TRUSS WHEEL CO.  
REX-WATSON CORPORATION  
FRINK SNOW PLOW CO.  
DAVEY AIR COMPRESSOR CO.

**Louisiana Tractor & Equipment Co.**  
Formerly LOUISIANA ROAD MACHY. CO.  
1111 Julia Street New Orleans, La.

*Representing*

ATHEY TRUSS WHEEL CO.—Wagons, Trailers, Wheels  
KILLEFER MFG. CORP.—Drag Scrapers, Road Scarifiers  
LA PLANT-CHOATE MFG. CO.—Steel Dump Wagons, Trailers  
BUFFALO-SPRINGFIELD ROLLER CO.—Road Rollers  
SPEEDER MACHINERY CORP.—Auto-Cranes, Draglines  
EAGLE WAGON WORKS—Dump Wagons  
ELGIN CORP.—Street Sweepers and Educators  
UNIVERSAL ROCK CRUSHER CO.—Crushers

**SHREVEPORT MACHY. SALES CO.**  
P. O. Box 840 Shreveport, La.

*Representing*

Barber-Greene Company  
Bay City Shovels, Inc.  
Brookville Locomotive Co.  
Erie—Rollers  
Garst—Drag Scrapers  
Lightning—Sand & Gravel Pumps  
Schramm Incorporated  
Smith-Engineering Works  
Pumps—For All Purposes

**D. C. ELPHINSTONE, INC.**  
Contractors' Equipment  
120 So. Calvert St. Baltimore, Md.

*Representing*

KOEHRING COMPANY	C. H. & E. MFG. CO.
T. L. SMITH CO.	DAYTON-DOWD CO.
INSLEY MFG. CO.	GOODALL RUBBER CO.
THE PARSONS CO.	EMERSON PUMP & VALVE
CLYDE IRON WORKS	GARDNER-DENVER CO.
GEO. HAISS MFG. CO.	H. K. PORTER CO.
SAUERMAN BROS., INC.	OWEN BUCKET CO.
McKIERNAN-TERRY	REED-PRENTICE CORP.

Member: Associated Equipment Distributors

**OLE K. OLSEN**

325 N. Cortez St. New Orleans

*Representing*

Ransome Concrete Machinery Co.	Wyoming Shovel Works
McKernan-Terry Corp.	Waukesha Motor Co.
American Cement Mach. Co.	Erie Bins & Batchers
American Saw Mill Machinery Co.	Patent Scaffolding Co.
Schramm, Inc.	Universal Form Clamp Co.
Ralph B. Carter Co.	Atlas Engineering Co.
G. H. Williams Co.	Bystone Mfg. Co.
Debbie Derricks	Leffel Co.
	Cleveland Wheelbarrow Co.
	H. W. Roos Co.
	American Steel & Wire Co.

Member: Associated Equipment Distributors

**C. M. CONANT COMPANY**  
Bangor Maine

*Representing*

CATERPILLAR TRACTOR CO.  
BARBER-GREENE CO.  
WIARD PLOW CO.  
LA PLANT-CHOATE MFG. CO.  
SPEEDER MACHINERY CO.  
SARGENT SNOW PLOWS  
MARION STEAM SHOVEL CO.  
CLEVELAND ROCK DRILL CO.

**JOHN C. LOUIS COMPANY**  
Incorporated  
221 S. Eutaw St. Baltimore, Md.

*Representing*

Jaeger Machine Company  
Barnes Manufacturing Company  
The Lakewood Engineering Co.  
Consolidated Concrete Machinery Corp.  
National Hoisting Engine Company  
American Cable Company  
The Browning Crane Co.  
Butler Bin Company  
National Brake & Electric Co.  
Wheeling Corrugating Company  
Good Roads Machinery Company  
Littelford Brothers  
The Foote Company  
Hotchkiss Steel Products Company  
Jones Superior Machine Co.  
The Burch Corporation  
Wappat Gear Works

Member: Associated Equipment Distributors

**C. T. PATTERSON COMPANY, Inc.**  
800 Tchoupitoulas St. New Orleans, La.

*Representing*

CLEVELAND Tractors	GALION Graders and Road Machinery
GEO. HAISS MFG. CO.	WRIGHT Hoists
RUMSEY PUMP CO.	MIAMI-CLETRAC Scrapers
AMERICAN Steel & Wire	HAUCK MFG. CO.
FAIRBANKS Wheelbarrows	Reinforcing Steel
SIMPLEX Jacks & Trench Boxes	JOHNS-MANVILLE
HANDY Buck Balers	Brake Lining
COLUMBIA Manila Rope	DOBBIE Derricks, Winches

**MAINE ROAD EQUIPMENT CO.**  
Congress Bldg. Portland, Me.

*Representing*

Four-Wheel Drive Auto Co.  
Universal Power Shovel Co.  
Rome Manufacturing Co.  
Universal Road Machinery Co.  
Owen Bucket Co.  
N. P. Nelson Iron Works  
Sargent Snow Plows

**THE HENRY H. MEYER CO.**  
110 S. Howard St., Baltimore, Md.  
1114-9th St., N. W., Washington, D. C.

*Representing*

Austin Machinery Co.	Harrington Co.
Blaw-Knox Co.	Lambert Hoisting Engine Co.
Boston & Lockport Block Co.	A. Leschen & Sons Rope Co.
Brookville Locomotive Co.	Pulometer Steam Pump Co.
Byers Machine Co.	Ransome Concrete Mach. Co.
Chausse Oil Burner Co.	Richmond Screw Anchor Co.
Conner & Co., Inc.	Sterling Wheelbarrow Co.
Domestic Engine & Pump Co.	Templeton-Kenly Co., Ltd.
E. I. Du Pont de Nemours & Co.	Toledo Pressed Steel Co.
Dobbie Fdy. & Machine Co.	Union Iron Works
Duff-Norton Mfg. Co.	Universal Road Machy. Co.

Member: Associated Equipment Distributors



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CONTRACTORS AND ENGINEERS  
MONTHLY

470 Fourth Ave. New York

## THE R. D. GRIER & SONS CO.

Machine Shop—Iron & Brass Foundry  
SALISBURY, Del-Mar-Va Peninsula, MARYLAND

### Representing

Fairbanks, Morse & Co.  
Wyoming Shovel Works  
Sterling Wheelbarrow Co.  
John A. Roebblings' Sons Co.  
Crane Co.  
National Tube Co.  
International Motor Trucks  
Goodyear Tire & Rubber Co.  
Manhole Frames, Covers & Drain Gates

## THE BOND CO.

Harold L. Bond, Pres.

84 HIGH ST. BOSTON, MASS.  
Contractors' Tools and Equipment

### Representing

SMITH—Mixers and Pavers  
KOEHRING—Cranes, Shovels and Mixers  
PARSONS—Trench Machines and Backfillers  
INSLEY—Excavators and Concrete Placing Equip.  
CHICAGO—Auto. Conveyors  
ROGERS—Trailers  
HAUCK—Kerosene Heaters  
JONES-SUPERIOR—Woolen and Mixers  
SASGEN—Derricks  
JOHNSON Bins and Batches  
NOVO—Gasoline Engines, Pumps and Hoists  
INGERSOLL-RAND—Air Compressors  
Member: Associated Equipment Distributors

## CLARK-WILCOX COMPANY

790-798 Albany St. Boston, Mass.

### Representing

BANSOME—Concrete Mixers, Chuting Equip.  
NORTHWEST—Cranes, Shovels, Draglines  
TRUCKTOR—Crawler Trucks  
BLAW-KNOX—Steel Forms, Bins, Buckets  
ORD—Concrete Road Finishers  
HUBER—Road Rollers  
CARTER—"Humdinger" Pumps  
INGERSOLL-RAND—Air Compressors  
ORE-SEMBOWER—Hoists, Boilers, Mixers  
BOOS—Shores and Clamps  
HAUCK—Oil Burners and Heaters

## THE EQUIPMENT CO.

23-29 Island St. Boston, Mass.

### Representing

LINK-BELT Cranes and Shovels  
HAISS Loaders, and Belt Conveyors  
INGERSOLL-RAND Compressors and Tools  
CONTINENTAL "Red Seal" Gas Engines  
LIDGERWOOD Hoists

## HEDGE & MATTHEIS COMPANY

285 Dorchester Ave. Boston, Mass.  
Providence, R. I. Boston, Mass. Springfield, Mass.  
Portland, Maine New Haven, Conn. Worcester, Mass.

### Representing

American Tubular Elevator Co.  
Austin Machinery Corp.  
Butler Bin Co.  
Blystone Manufacturing Co.  
Cleveland Wheelbarrow & Mfg. Co.  
Easton Car & Construction Co.  
Hercules Motors Corp.  
Homelite Corporation  
Ingersoll-Rand Co.  
Jaeger Machine Co.  
Lakewood Engineering Co.  
Dobbie Foundry & Machine Co.  
Lawrence Pump & Engine Co.  
LeRoi Company  
A. Leschen & Sons Rope Co.  
Littleford Bros.  
McKiernan-Terry Corp.  
Mead-Morrison Mfg. Co.  
Miles Mfg. Co.  
Sasgen Derrick Co.  
The Ohio Power Shovel Co.  
Tolado Pressed Steel Co.  
Universal Power Shovel Co.  
Wood Shovel & Tool Co.  
G. H. Williams Co.  
Member: Associated Equipment Distributors

## P. I. PERKINS COMPANY

376 Dorchester Ave. Boston, Mass.

### Representing

"CATERPILLAR" Tractors  
"CATERPILLAR" Graders  
WAUSAU—Plows  
LA PLANT-CHOATE Bulldozers  
REX—Pumps  
PIERCE—Rollers  
BYERS—Cranes and Shovels  
REX—Mixers, Pavers  
MUNDY—Hoists  
OWEN—Buckets  
SCHRAMM—Air Compressors

## RAPP-HUCKINS COMPANY, Inc.

Established 1900

138-148 Beverly Street  
North Station Industrial Bldg.  
Boston, Mass.

### Sales and Service

Climax "Trustworthy" Engines  
Twin Disc Clutches  
Buda Engines  
Gasoline and Oil Engines  
Continental Industrial Engines  
Telephone Capital 1322-1323

## WE DO NOT CHOOSE TO RUN—

anything in this Directory that is not accurate and up-to-date. Therefore, if you find any errors or corrections we hope you will let us know about them. Thank you.

CONTRACTORS AND ENGINEERS  
MONTHLY

470 Fourth Ave. New York

## GEO. H. SAMPSON CO.

Contractors' Supplies

80 Federal St. Boston, Mass.  
Telephone, Liberty 7479

### New England Representatives for

INGERSOLL-RAND COMPANY  
Air Compressors  
Jackhamers, Pneumatic Tools, Pumps  
ATLAS POWDER CO.—Dynamite  
KEYSTONE Concrete Mixers  
SASGEN DERRICK CO.—Derricks

## DYAR SALES & MACHINERY CO.

66 Broadway Cambridge, Mass.

S. G. Adams Co.—Traffic Signs  
J. D. Adams Co.—Motor Graders, Tractor Graders, Road Drains  
Aerol Burner Co.—Asphalt "Smokeless" Heaters  
Oliver Ames & Sons—Shovels, Scoops  
Barnes Mfg. Co.—Pumps  
Baker Mfg. Co.—Truck and Tractor Snowplows  
Burch Corp.—Spreaders and Unloaders  
Gilson Bros.—Concrete Mixers  
Chas. Hyatt & Co.—Sweepers, Brooms, Sprinklers, Trailers, Asphalt Plants and Sand Spreaders  
Iowa Mfg. Co.—Gravel Reduction Plants, Crushers  
J. P. Healy Co.—Catch Basin Cleaners  
Illinois Wire & Mfg. Co.—Snow Fence  
Klein-Logan Co.—Ficks, Hammers, Crow Bars  
Monarch Tractor Co.—Tractors  
Rex-Watson Corp.—Wagons, Trailers  
Western Crucible Steel Casting Co.—Shovel Teeth  
Wileox Bros.—Multi-Foot Pavers

## H. F. DAVIS TRACTOR CO., Inc.

59 Montgomery Ave. Holyoke, Mass.

### Representing

Cletrac Tractors  
Walsh Snow Plows  
Automatic Scrapers  
Bulldozers  
Road Plows  
Saw Rigs

## WE WOULD LIKE TO HAVE YOU HELP US

make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS  
MONTHLY

470 Fourth Ave. New York

## M. B. TYLER COMPANY

344 Columbus Ave., Springfield, Mass.

### Representing

"CATERPILLAR" Tractors, Road Machinery and Combines (Conn. & Western Mass. Terr.)  
KILLEFER Tractor Implements  
LA PLANT-CHOATE Trailers and Snow Plows  
WILLAMETTE-ERSTED Hoists for "Caterpillars"  
W-K-M Hoists and Rock Crusher for Tractors  
DAVIS Air Compressor Attachments for Tractors  
FARQUHAR Boilers and Engines  
PIONEER Gravel Equipment, Screens, etc.  
HI-WAY SERVICE Snow Plows  
DETROIT HARVESTER Mowers and Snow Brushes  
INGERSOLL-RAND Air Compressors, Tools  
EUCLID Scrapers and Wagons  
HERCULES Gasoline Rollers

## NEW ENGLAND IMPLEMENT CO., Inc.

22 Garden St. 61 N. Beacon St.  
WORCESTER, MASS. BOSTON, MASS.

### Representing

International Harvester Co.  
Trackson Co.  
Wehr Company  
Maine Steel Products Co.  
Whitehead & Kalen Co.  
Bay City Shovels, Inc.  
Willamette-Ersted Co.  
Hughes-Keenan, Inc.  
Sauerman Brothers, Inc.  
Miami Trailer-Scrapers Co.  
Baker Manufacturing Co.

### THE MAMER COMPANY

Benton Harbor Michigan

Representing

Jaeger Machine Co.

C. H. & E. Manufacturing Co.

Skillsaw, Incorporated

Miscellaneous Equipment

### HUNTER MACHINERY COMPANY

221-241 Waterman Ave., Detroit, Mich.  
Grand Rapids, Pittsburgh, Milwaukee

Representing

CHAIN BELT Mixers, Pavers, Pumps, Saw Rigs, Elevators  
NORTHWEST Cranes, Shovels and Draglines  
BLAW-KNOX Buckets, Bins, Batches and Forms  
SULLIVAN Air Compressors  
HOMELITE Pumps  
SAUERMAN Draglines  
CLYDE Hoists, Derricks  
ORD Finishing Machine  
LESCHEN Wire Rope  
TRACKSON Crawlers  
GOROCO Spreaders  
LEROI Engines  
Member Associated Equipment Distributors

### WALLACE EQUIPMENT COMPANY

Phone: Garfield 3085

8511 Livernois Ave. Detroit, Mich.

Agents for:

ROOS—Shores and Clamps

UNIVERSAL—Clamps

PATENT—Scaffolds

PLYMOUTH—Locomotives

HELTZEL—Steel Forms

### WILLIAM FORD TRACTOR SALES COMPANY

6405 Schaeffer Road Dearborn, Mich.

Flint—Grand Rapids—Toledo

Representing

Ford Motor Company  
Bucher-Gibbs Flow Co.  
Ferguson-Sherman, Inc.  
Roderick-Lean Mfg. Co.  
Whitehead & Kales Co.  
Detroit Harvester Co.  
Stover Mfg. Co.  
W. A. Riddell Co.  
Wehr Company  
Willamette-Ersted Co.  
Stoughton Company  
Radiator Engr. Corp.  
Gustav Schaefer Co.  
U. S. Body & Forging Co.  
W. M. Blair Mfg. Co.  
Trackson Company  
Baker Mfg. Co.  
Sidney Steel Scraper Co.  
Perfection Steel Body Co.  
St. Paul Hydraulic Hoist Co.  
Kingham Trailer Co.  
York-Hoover Body Corp.

### Keller Tractor & Shovel Company, Inc.

5124-70 Braden Avenue

Detroit Michigan

Distributors of

"CATERPILLAR" Tractors, Graders, Combines  
KILLEFER Road and Farm Tools  
LA PLANE-CHOATE Bulldozers, Backfillers, Wagons, Snow-plows  
ATECO Hydraulic Scrapers  
BAKER MANEY Road Scrapers, Snowplows  
WILLAMETTE Hoist for "Caterpillars"  
BUCYRUS-ERIE Shovels, Cranes and Clamshells  
WILLIAMS Clamshell and Dragline Buckets  
DETROIT HARVESTER Sweepers and Brushes

### E. K. S. EQUIPMENT CO.

18 Grandville Ave., S.W., Grand Rapids, Mich.

Representing

KOEHRING CO.  
INSLEY MFG. CO.  
T. L. SMITH CO.  
PARSONS CO.  
C. H. & E. MFG. CO.  
LIDGERWOOD MFG. CO.  
MACWHYTE CO.  
ROME GRADERS  
ALLIS-CHALMERS CO.  
C. S. JOHNSON CO.  
BAKER MFG. CO.  
SCHRAMM, INC.  
LITTLEFORD BROS.  
STROUD ROAD MACHINERY CO.  
FOUR WHEEL DRIVE TRUCKS  
WOOD SHOVEL & TOOL CO.

### CYRIL J. BURKE

Great Lakes Terminal Warehouse  
DETROIT MICHIGAN

Representing

Lakewood Engineering Co.  
Highway Truck Mixer Co.  
General Excavator Co.  
Dobbie Foundry & Machine Co.  
Hercules Motors Corp.  
J. S. Mundy Hoisting Engine Co.  
J. M. Willard Co.  
Upson-Walton Co.  
A. S. Marlow Co.  
J. I. Case Co.

### R. G. MOELLER COMPANY

14415 Meyers Rd. Detroit, Mich.

Representing

American Tubular Towers  
Barnes—Pumps  
Erie—Steel Bins, Aggregators and Buckets  
Goodell—Hose, Bells and Slickers  
General—Wheelbarrows, Concrete Carts  
Ingersoll-Rand—Compressors, Air Tools  
Knickerbocker—Concrete Mixers, Saw Rigs  
Lazawana—Steel Sheet Piling  
National—Hoisting Engines and Winches  
Sasgen—Derricks and Winches  
Thew—Shovels, Cranes and Draglines  
Union—Pile Hammers, Mixers, Air Locks  
Wickwire-Spencer—Wire Rope, Blocks, etc.  
Wood—Shovels, Picks and Maule  
Member: Associated Equipment Distributors

### HUNTER MACHINERY COMPANY

530-532 Monroe Ave., N.W. Grand Rapids, Mich.  
Detroit, Pittsburgh, Milwaukee

Representing

CHAIN BELT Mixers, Pavers, Pumps, Saw Rigs, Elevators  
NORTHWEST Cranes, Shovels and Draglines  
BLAW-KNOX Buckets, Bins, Batches and Forms  
SULLIVAN Air Compressors  
HOMELITE Pumps  
SAUERMAN Draglines  
CLYDE Hoists, Derricks  
ORD Finishing Machines  
LESCHEN Wire Rope  
TRACKSON Crawlers  
GOROCO Spreaders  
Member: Associated Equipment Distributors

### Contractors' Equipment Co., Inc.

5139-5169 Martin St., Detroit, Mich.

Representing

MOORE Speedcranes, Shovels Draglines  
DOMESTIC Pumps and Hoists  
LEACH Mixers and Mast Plants  
GARDNER-DENVER Air Compressors and tools  
MULTI-FOOTE Pavers  
HUBER Rollers  
CEDAR RAPIDS Crushers and Gravel Handling Equipment

A complete line of Construction Equipment

### O'NEAL TOOL & SUPPLY CO.

5327 Livernois Ave. Detroit, Mich.

Representing

BLYSTONE MFG. CO.—Plaster and Mortar Mixers  
CHASE FOUNDRY & MFG. CO.—Industrial Cars  
GENERAL WHEELBARROW CO.—"Akron" Wheelbarrows, Concrete Carts, Mortar Boxes, Salamanders, Scrapers, Coal Chutes  
STEEL SCAFFOLDING CO.—Adjustable Steel Trestles, Carpenters' Brackets, Ladder Jacks, Mortar Board Stands, etc.  
Also  
Equipment for Concrete Products Plants, Concrete Mixers, Pumps, Engines, Saw Rigs, Gas and Electric Hoists, Shovels, Air Compressors, etc.

### THE KELLOGG-BURLINGAME CO.

67 Market Ave., N. W. Grand Rapids, Mich.

Representing

Novo Engine Co.  
Butler Bin Company  
Freeman Manufacturing Co.  
Knickerbocker Co.  
Union Steam Pump Co.  
F. E. Myers & Bros. Co.  
American Steel & Wire Co.  
Jones-Superior Machine Co.

### THE EARLE EQUIPMENT CO.

6331-51 Tireman Ave. Detroit, Mich.

KOEHRING CO. Representing  
INSLEY MANUFACTURING CO.  
T. L. SMITH CO. THE PARSONS CO.  
C. H. & E. MFG. CO.  
C. S. JOHNSON CO.  
FOUR WHEEL DRIVE CO.  
CLEVELAND ROCK DRILL CO.  
ACME ROAD MACHINERY CO.  
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BARNES MFG. CO.—Pumps

HELTZEL STEEL FORM & IRON CO.—Forms, Bins,

Batcher Plants

LITTLEFORD BROS.—Tar and Asphalt Kettles

JAEGER MACHINE CO.—Concrete Mixers, Pumps

THE BURCH CORP.—Unloaders, Conveyors, Spreaders

CLEVELAND ROCK DRILL CO.—Rock Drills, Paving

Breakers

EAGLE WAGON WORKS—Dump Wagons

McCLOSKEY TORCH CO.—Bombshell Torches

ALUMYOY SIGNAL & SIGN CO., CHICAGO—Reflecting

Signals and Street Signs

SAGEN DERRICK CO.—Derricks, Winches

OWEN BUCKET CO.—Clamshell Buckets

LAKEWOOD FNG. CO.—Paving, Building and Industrial

Equipment

### The National Supply Company

TOLEDO, OHIO

Contractors' Equipment and Supplies

DISTRIBUTORS FOR

Ingersoll-Rand Co.

Ransome Concrete Machine Co.

Novo Engine Co.

Eyers Machine Co.

Beebe Hand Hoists

Roebbing's Wire Rope

Red Edge Shovels

and other high class goods.

### LELAND EQUIPMENT COMPANY

Tulsa—Oklahoma City

OKLAHOMA

Distributors for

NATIONAL EQUIPMENT CORP.—Concrete Mixers, Pav-

ers, Chuting Equipment, Towers, Derricks, Hoists, Pumps,

Excavators, Cranes, Trenching Machines and Back-Fillers

BLAW KNOX CO.—Bins, Forms, Buckets

IOWA MANUFACTURING CO.—Rock Crushing Plants

SCHRAMM IN2.—Air Compressors, Pneumatic Tools

McCLOSKEY—Torches

McKIERNAN-TERRY CORP.—File Hammers, Steam, Elec-

tric and Gasoline Hoists

ST. PAUL HYDRAULIC HOIST MFG. CO.—Hydraulic

Hoists and Dump Bodies

C. H. & E.—Portable Saw Rigs

Conveyors, Loaders, Wheelbarrows, Tar Kettles

Complete Line of Truck Equipment



### MILLER-SANFORD TRACTOR CO.

Eugene — Klamath Falls — Medford

#### OREGON

##### Representing

Caterpillar Tractor Co.  
Tractors — Graders — Harvesters  
American Tractor Equipment Co.  
Killefer Manufacturing Co.  
Willamette-Ersted Co.

### FEENAUGHTY MACHINERY CO.

320-338 Belmont St. Portland, Ore.  
Spokane — Seattle — Boise

##### Representing

American Saw Mill Machinery Co.  
Chicago Pneumatic Tool Co.  
Construction Machy. Co.  
Four Wheel Drive Auto Co.  
Gallon Iron Works and Mfg. Co.  
Foote Bros., Gear and Machine Co.  
Littleford Bros.  
Penna. Boiler Works  
Pickering Governors  
Sidney Steel Scrapers  
Sterling Wheelbarrows  
Thew Shovel Co.  
Universal Crane Co.  
Diamond Iron Works  
Birdsell Mfg. Co.  
Avery Power Machinery Co.  
Mansey-Harris Co.

Member: Associated Equipment Distributors

### Western Road Machinery Co.

220-222 E. Water St. Portland, Ore.

##### Representing

SMITH ENGINEERING WORKS—Telemith Crushers  
MADSEN IRON WORKS—Portable Asphalt Paving Plants  
METALWELD, INC.—Portable Air Compressors  
OHIO POWER SHOVEL CO.—LIMA 1 & 1½ yd. Shovel  
HANSON CLUTCH MACHY. CO.—¾-yard Shovel  
HUBER MFG. CO.—Road Rollers  
J. D. ADAMS CO.—Adjustable Leaning Wheel Graders  
BURCH CORP.—Stone Spreaders, Conveyors  
HIGHWAY—Heavy-Duty Machy. Trailers  
MUNICIPAL SUPPLY CO.—Oil Distributors  
GENERAL EXCAVATOR CO.—General Half Yard Shovel

Member: Associated Equipment Distributors

### BUNTING TRACTOR COMPANY

LaGrande, Ore. Boise, Idaho

##### Representing

Caterpillar Tractor Company  
"Caterpillar" Tractors  
"Caterpillar" Combines  
"Caterpillar" Road Machinery  
Athey Truss Wheel Company  
LaPlant-Choate Mfg. Company  
American Tractor Equipment Co.  
Killefer Manufacturing Company  
Willamette-Ersted Company  
Williamsport Wire Rope Company

### J. L. LATTURE EQUIPMENT CO.

312-14 E. Madison St. Portland, Ore.

##### Representing

Keystone Driller Co.  
The Knickerbocker Co.  
Superior Engine Co.  
American Steel Scraper Co.  
Wood Shovel & Tool Co.  
Union Iron Works  
Blow-Knox Co.  
Rome Mfg. Co.  
Lauson Mfg. Co.  
Le Roi Co.  
Autocar Co.  
Climax Engineering Co.  
Rix Compressor Co.  
The Macleod Co.  
S. Flory Mfg. Co.

Buffalo-Springfield Roller Co.

### ZIMMERMAN-WELLS-BROWN CO.

P. O. Box 107 Portland, Ore.

##### Representing

A. LESCHEN & SONS ROPE CO. —Wire Rope  
NORTHWEST ENGINEERING CO. —Shovels  
GOULDS PUMPS, INC. —Power Pumps  
AMERICAN LOCOMOTIVE CO. —Locomotives  
GARDNER-DENVER CO. —Steam Pumps, Compressors  
AMES IRON WORKS —Engines & Boilers

### HUBBARD BROS. INC.

Medford Oregon

##### Representing

Cleveland Tractor Co.  
Killefer Mfg. Co.  
John Bean Mfg. Co.  
American Rubber Co.  
American Pulley Co.

### LOGGERS & CONTRACTORS MACHINERY COMPANY

345 E. Madison St. Portland, Ore.

##### Representing

Caterpillar Tractor Co.  
Link Belt Co.  
Archer Iron Works  
Athey Truss Wheel Co.  
LaPlant-Choate Mfg. Co.  
Killefer Manufacturing Corp.  
Chain Belt Co.  
Butler Bin Co.  
Speeder Machinery Corp.  
Plymouth Locomotive Works  
G. H. Williams Co.  
Buckeye Traction Ditcher Co.  
Willamette Ersted Co.  
American Tractor Equipment Co.

### G. M. STULL COMPANY

Chester Pennsylvania

##### Representing

Universal Power Shovel Co.  
Whitehead & Kales Co.  
Wehr Company  
Perry Company  
Gustav Schaefer Company  
W. M. Blair Mfg. Co.  
Stover Mfg. & Engine Co.  
Baker Manufacturing Co.  
Schramm, Incorporated  
Miami Trailer-Scraper Co.  
B. F. Goodrich Rubber Co.  
Trackson Company  
Saerman Bros., Inc.  
"Equipment and Supplies for the Fordson"

### BALZER MACHINERY COMPANY

267½ Oak Street Portland, Ore.

##### Representing

GARDNER-DENVER CO. — Air Compressors, Drills, etc.  
WHEELING MOLD & FOUNDRY CO. — Jaw Rock Crushers  
OHIO LOCOMOTIVE CRANE CO. — Locomotive Cranes  
MARION STEAM SHOVEL CO. — Steam Shovels  
NIAGARA CONCRETE MIXER CO. — Vibrating Screws  
CHICAGO AUTOMATIC CONVEYOR CO. — Conveyors, Loaders, etc.  
S. D. LE CLAIRE CO. — Dragline Buckets  
J. S. MUNDY HOISTING ENGINE CO. — Steam, Gas and Electric Hoists

### McCRAKEN-RIPLEY CO.

61-67 Albina Ave. Portland, Ore.

##### Representing

Ransome Concrete Machinery Co. — Mixers, Etc.  
W. A. Biddell Co. — Road Building Machinery  
Atlas Lumnite Cement Co. — Lumnite Cement  
Universal Atlas Cement Co. — White Cement  
Union Metal Mfg. Co. — Metal Columns  
M. & M. Form Clamp Co. — Form Clamps  
Blystone Mfg. Co. — Plaster Mixers  
Red Star Products Corp. — Red Star Wheelbarrows, Concrete Carts  
Novo Engine Co. — Engines, Hoists, Pumps  
W. E. Meadows, Inc. — "Seal-Tight" Expansion Joints  
Northern Conveyor & Mfg. Co. — Portable Conveyors  
Patent Scaffolding Co. — Swinging and Tubular Scaffolds

### BARNARD TRACTOR & EQUIPMENT CO.

15th & Mayflower Sts., Harrisburg, Pa.

##### Representing

CATERPILLAR Tractors and Graders  
LA PLANT-CHOATE Wagons, Backfillers, Bulldozers and Snow Plows  
BAKER MANEYS Drags and Maintainers  
DOMESTIC Pumps  
SCHRAMM Air Compressors  
CLEVELAND Air Tools, Etc.  
ATHEY Crawler Wagons  
EUCLID Bulldozers, Scarifiers  
WAUSAU Tractor Hoists and Logging Equip.  
WILLAMETTE Agricultural Tools  
KILLEFER Earth Handling Equipment  
ATECO

### CLYDE EQUIPMENT CO.

Contractors' Equipment and Supplies

Portland, Oregon Seattle, Wash.

Acme Road Machy. Co.  
Clyde Iron Works  
Homelite Corp.  
Jaeger Machine Co.  
Lee Trailer & Body Co.  
Lincoln Electric Co.  
Bucyrus-Erie Co.  
Conneaut Shovel Co.  
Geo. Haiss Mfg. Co. Inc.  
Sauerman Brothers  
Lakewood Engineering Co.  
Sterling Wheelbarrow Co.  
Sullivan Machinery Co.  
Traylor Engr. & Mfg. Co.  
McKleran-Terry Corp.  
Klauser Mfg. Co.  
Foote Company Inc.  
Atlas Imperial Diesel Eng. Co.

Member: Associated Equipment Distributors

### MITCHELL, LEWIS & STAVEL CO.

330 E. Morrison St., Portland, Ore.

##### Representing

ANTHONY CO. — Power Hoist Dump Bodies  
SOLANO IRON WORKS — "Pacific" Revolving Tractor Scrapers, Fresno Scrapers  
THE NEW WAY MOTOR CO. — Air-Cooled Engines  
STOVER MFG. & ENGINE CO. — Gasoline Engines  
THE F. E. MYERS & BROTHER CO. — Power Pumps

### HERR "THE PUMP MAN"

Lancaster Penna.

##### Representing

Gould Pumps, Inc., Pumps  
Jaeger Machine Co., Mixers, Hoists  
Century Electric Co., Motors  
Louden Machinery Co., Barn Equipment  
Domestic Engine & Pump Co., Hoists and Compressors and Pumps  
Fuller & Johnson Co., Gas Engines  
Metalweld-Worthington Air Compressors  
Wood Working Machinery  
Barrows and Cement Tools

# BOWEN MACHINERY CO.

Excavating—Construction—Industrial  
**EQUIPMENT**

1126 N. Delaware Ave. Philadelphia, Pa.

## Representing

**BYERS MACHINE COMPANY**  
Shovels, Cranes, Draglines  
**MOORE TRENCH MACHINE CO.**  
Dry Well Point Systems  
**TAYLOR-WHARTON IRON & STEEL CO.**  
Dredge Buckets, Teeth, Lips and Wire Screening

# LODER & SHARP, INC.

"Everything for Roads"  
32nd Street and Powelton Avenue  
PHILADELPHIA, PA.

## Representing

**F. W. D. Trucks**  
**BATES Tractors**  
**ROME Graders**  
**RELIANCE Crushers**  
**HUBER Rollers**  
**WHEELING Pipe**

# J. JACOB SHANNON & CO.

1744 Market Street 1744  
PHILADELPHIA

## Representing

**MUNDY Hoisting Engines**  
**ROEBLING Wire Rope**  
**WILLIAMS Clam Shell Buckets**  
**NOVO Gasoline Engines**  
**SASGEN Derricks & Winches**  
**BERG Concrete Surfaces**  
**WYOMING "Red Edge" Shovels**  
**BATES Wire Ties and Tying Tools**  
**TERRY Steel Derricks**  
**"RED STAR" Adjustable Jack-Shores**  
**BERG Hi-Way Surfactors**  
**LEACH Concrete Mixers**  
**LAKEWOOD Material Towers**  
**LAKEWOOD Road Equipment and Finishers**  
**MULTIPLEX Electric Saws**  
**RED STAR Column Clamps**  
**RED STAR Barrows & Carts**  
**UNIVERSAL Form Clamps and Concrete Accessories**

# CONTRACTORS EQUIPMENT & SUPPLY CO.

31st and Chestnut Streets  
Philadelphia Pennsylvania

## Representing

**THE MARION STEAM SHOVEL CO.**  
Steam, Gas, Gas-Electric, Diesel and Electric  
**AMERICAN STEEL SCRAPER CO.**  
Wheelbarrows — Scrapers — Road Drags  
**A. LESCHEN & SONS ROPE CO.**  
Hercules "Red Strand" Wire Rope  
**MORSE-STARRETT PRODUCTS CO.**  
Wire Cable Cutter and Bands

# MAERKY MACHINE WORKS

632 Race Street  
Philadelphia Penna.

## Representing

**The Climax Engineering Co.**  
**Twin Disc Clutch Co.**  
**Modern Equipment Co.**

# LEE T. WARD CO., Inc.

2361 E. Tioga St. Philadelphia

**Kochring Co.**  
**Insley Mfg. Co.**  
**Parsons Co.**  
**T. L. Smith Co.**  
**General Wheelbarrow Co.**  
**C. H. & E. Mfg. Co.**  
**C. S. Johnson Co.**  
**Hotchkiss Steel Form Co.**  
**Universal Form Clamp Co.**  
**National Hoisting Engine Co.**  
**Kwik-Mix Concrete Mixer Co.**  
**National Brake & Electric Co.**

# DE HUFF AND HOPKINS

261 N. Broad Street Philadelphia

## Representing

**BAY CITY SHOVELS INC.**  
Tractor Shovels, Cranes, Model K 1/2 yd. Model R 3/4 yd. Model S 1 yd.  
**EASTON CAR & CONSTRUCTION CO.**  
Dump and Flat Cars for Construction Work  
Concrete Handling Dump Bodies  
Turntables—Portable—Track—Rails, etc.  
**BROOKVILLE LOCOMOTIVE CO.**  
Ford and McCormick-Deering Type Gasoline Locomotives  
**MILWAUKEE LOCOMOTIVE MFG. CO.**  
Gasoline Locomotives, 4 to 30 tons.  
Portable Belt Conveyors  
Valves and Sluice Gates  
Steel Plate Work

# HOWARD W. READ CORP.

800 N. Delaware Ave. Philadelphia, Pa.

## Distributors

**JAEGER MACH. CO.** —Concrete Mixers  
**ORB & SEMBOWER** —Hoists  
**DOMESTIC ENGINE & PUMP CO.** —Pumps  
**JONES SUPERIOR** —Saw Rigs  
**LINK-BELT** —Shovels  
**PENNA. BOILER WKS.** —Boilers

Additional equipment in stock:

**McKIERNAN-TERRY**—Hammers  
**INGERSOLL-RAND**—Compressors  
**UNIVERSAL**—Truck Cranes

# ALLEGHENY EQUIPMENT CORP.

Grant Building Pittsburgh, Pa.

## Distributors for

**Allis-Chalmers Monarch and Industrial Tractors**  
**Sargent Snow Plows**  
**"Bully" Gear Operated Bulldozers**  
**Ryan Road Graders**  
**Stroud Elevating Graders**  
**"American" Hoists and Derricks**  
**"American-Terry" Derricks**  
**"Ransome" Building and Paving Mixers**  
**"Gardner-Denver" Compressors and Drills**  
**"Hercules" Road Rollers**  
**"Northwest" Power Shovels and Cranes**  
**"Berg" Highway Surfactors**  
**"Domestic" Road, Diaphragm, and Auto-Priming Centrifugal Pumps**  
**"LaBoar" Self-Priming Centrifugal Pumps**  
**"Wheeling" Roller Bearing Crushers**  
**"Jackson" Concrete Placement Vibrators**  
**"Williams" Arch Girder Trailers**  
Member: Associated Equipment Distributors

# EDELEN & BOYER COMPANY

Office and Warehouse 236 N. 23rd St. Philadelphia Penna.

## Distributors for

**Lime "101" Shovel, Crane & Tractor**  
**General Shovels, Cranes, Skimmer, Back Hoe**  
**Multi Foot Pavers**  
**Flory Hoists**  
**Froeman Turntables**  
**Hetzl Steel Road Forms**  
**Hetzl Sidewalk & Gutter Forms, Bins and Batches**  
**Saugen Derricks & Elevators**  
**Saugen Drag Scrapers and Cableways**  
**Wander Mixers and Pumps**  
**Miles Block Machines**  
Member: Associated Equipment Distributors

# SERVICE EQUIPMENT COMPANY

"Everything for the Contractor"

211 North Third St. Philadelphia, Pa.

## Representing

**LEACH CO.** —Concrete, Plaster and Mortar Mixers, Saw Rigs, Mast Plant Equipment  
**DOMESTIC HOIST & ENGINE CO.** —Hoists and Elevators  
**WAPPAT GEAR WORKS** —"Alta" Saws and Electric Tools  
**BUHL COMPANY** —Air Compressors  
**CLEVELAND ROCK DRILL CO.** —Air Tools  
**Fox Shovels, Lansing Wheelbarrows and Miscellaneous Small Equipment for the Contractor**  
Member: Associated Equipment Distributors

# C. H. ARNOLD COMPANY, Inc.

Road and Street Machinery Contractors' Equipment  
629-630 Park Bldg. Pittsburgh, Penna.

## Representing

**THE FOOTE COMPANY** —Multifoot Paving Mixer  
**BLAW-KNOX COMPANY** —Road and Sidewalk Forms, Bins, Etc.  
**A. W. FRENCH & CO.** —ORD Concrete Road Finishing Machines  
**ALLIS-CHALMERS MFG. CO.** —"MONARCH" Tractors  
**LITTLEFORD BROS.** —Tar and Asphalt Heating Equipment  
**GENERAL EXCAVATOR CO.** —Gas Shovels, Cranes and Draglines  
**BARNES MFG. CO.** —Force Feed and Diaphragm Type Pumps  
**J. D. ADAMS CO.** —Earth Moving Equipment

# GILES & RANSOME

231-33 No. 12th St., Philadelphia, Pa.

**RANSOME CONCRETE MACHINERY CO.** —Concrete Mixers and Appliances  
**BLAW-KNOX CO.** —Clam-shell Buckets, Steel Forms, Steel Buildings, Steel Bins  
**RICHMOND SCREW ANCHOR CO.** —Concrete Specialties  
**THE BARNES MFG. CO.** —Centrifugal Diaphragm and Force Pumps  
**NORTHWEST ENGINEERING CO.** —Gasoline Cranes and Shovels  
**ORD** —Road Finishing Machine  
**CLTDE** —Hoisting Engines and Derricks  
Member: Associated Equipment Distributors



# SERVICE SUPPLY CORPORATION

20th and Venango Sts.  
PHILADELPHIA, PA.

**Chain Belt Co.** —Rex Pavers, Mixers, Pumps  
**Owen Bucket Co.** —Clamshell Buckets  
**Lidgerwood Mfg. Co.** —Hoists, Winches, Cableways  
**Dravo Equipment Co.** —American Tubular Towers  
**Hercules Co.** —Road Rollers —Union—Pile Hammers  
**International Harvester Co.** —Industrial Tractors  
**Allis-Chalmers Mfg. Co.** —"Monarch" Tractors  
**W. A. Riddell Co.** —Graders, Scrapers & Trucks for Tractors  
**Butler Bin Co.** —Bins, all sizes R. B. Carter—Pumps  
**Trackson Co.** —Crawlers, Shovels and Bulldozers  
**Hughes-Keenan Co.** —Iron Mules  
**Chicago Pneumatic Tool Co.** —Air Compressors and Tools  
**Littleford Bros.** —Asphalt and Tool Heaters  
Member: Associated Equipment Distributors

# BRINKER SUPPLY COMPANY

905 Clark Bldg. Pittsburgh, Penna.  
Road and Street Machinery Contractors' Equipment and Supplies

## Representing

**WARCO** —One Man Graders  
**HUBER** —Motor Rollers  
**ROME** —Road Graders  
**BATES** —Steel Mules  
**BOSS** —Concrete Mixers  
**"Toscan" Culvert Pipe**  
**CANTON** —Forms, Bins & Batches  
**HELTZEL** —Air Compressors  
**SCHRAMM** —Car Unloaders, Stone and Asphalt Spreaders  
**BURCH** —Tractors and Industrial Equipment  
**McCormick-Deering** —Tractors and Industrial Equipment  
**UNIT** —Gasoline Shovels  
**Tar Kettles — Heaters — Traffic Signs**

### DRAVO EQUIPMENT CO.

300 Penn Ave. Pittsburgh, Pa.

AMERICAN—Tubular Towers  
CHICAGO PNEUMATIC—Portable Air Compressors  
NOVO—Pumps, Hoists, Engines  
MARSH-CAPRON—Rail Track Mixers  
WONDER—Concrete Mixers  
JONES-SUPERIOR—Saw Rigs  
EZZEL—Steel Road Forms  
UNION IRON WORKS—Pile Hammers  
FREUHAUF—Trailers  
ATLAS—Shores  
WAPPATT—Saws  
BURT—Ventilators  
WILLIAMSPORT—Wire Rope

Member: Associated Equipment Distributors

### Pittsburgh Machinery & Equipment Company

Fulton Bldg. Pittsburgh, Pa.

#### Contractors' Machinery

In Stock at Aspinwall, Pa.  
BUCYRUS-ERIE STEAM SHOVELS  
BUFFALO-SPRINGFIELD ROAD ROLLERS  
Locomotive Cranes  
Dinky Locomotives  
Hoisting Engines  
Concrete Mixers  
Pumps, Derricks, Buckets  
Rock Crushers

### THE CAMERON & BARKLEY CO.

Machinery and Supplies  
Contractors' Equipment  
CHARLESTON, S. C. JACKSONVILLE, FLA.  
TAMPA, FLA. MIAMI, FLA.



Distributing  
"LINK - BELT" Transmission Materials  
"WONDER" Tilting Concrete Mixers  
HUMDINGER Power Diaphragm Pumps  
C H & E Saw Rigs and Hoists  
SCHRAMM Air Compressors  
STOVER Gasoline Engines  
ROEBLING Wire Rope  
WORTHINGTON Pumps  
MYERS Pumps  
Florida Distributors for Philip Carey Co.'s  
Line of Asbestos and Asphalt Products

### HUNTER MACHINERY COMPANY

6617 Hamilton Ave. Pittsburgh, Pa.  
Detroit, Grand Rapids, Milwaukee

#### Representing

Archer—Tubular Towers and Spouting Equipment  
Austin—Trenchers and Backfillers  
Bates—Wire Ties  
Berg—Concrete Surfaces  
Chain Belt—Mixers, Pavers, Pumps, Saw Rigs, Elevators  
Chyd—Hoists, Derricks  
Erie—Bins, Agrometers, Buckets  
Hotchkiss—Road, Sidewalk and Wall Forms  
Londellus—Water Heaters  
Moritz-Bennett—Shouldering Machine  
Pulsometer—Steam Pumps  
Red Star—Carts and Barrows  
Sasgen—Derricks, Winches  
Sauerman—Draglines  
Sullivan—Air Compressors

### GEORGE W. ZIEGLER MACHY. CO.

Contractors Equipment

Office and Warehouse Yards and Shops  
Pittsburgh, Pa. Rook, Pa.

#### Representing

JAEGER—Concrete Mixers, Pumps, Hoists  
NATIONAL—Air Compressors  
OSGOOD—Shovels, Cranes, Draglines  
FOUR WHEEL DRIVE—Trucks  
GILBERT—Power Graders  
HOMELITE—Pumps, Generators, Blowers  
ROTARY SNOW PLOW—Snow Plows  
BUTLER—Steel Bins, Weighing Hoppers  
CLEVELAND TRACTOR—Tractors, Bulldozers  
HANSON—Shovels, Cranes, Hoops  
KIESLER—Clamshell Buckets  
CLEVELAND—Rock Drills, Spades, Tampers  
Member: Associated Equipment Distributors

### CAROLINA CONTRACTORS' EQUIPMENT & SUPPLY COMPANY, INC.

P. O. Box 576 Columbia, S. C.

#### Representing

J. D. Adams Co.  
Koehring Co.  
T. L. Smith Co.  
Insley Mfg. Co.  
The Parson Co.  
C. H. & E. Mfg. Co.  
Barnes Mfg. Co.  
A. W. French & Co.  
E. D. Entyre & Co.  
Sevramm, Inc.  
M-W Lubricants Corp.  
Fox Shovels  
Cleveland Wheelbarrow & Manufacturing Co.  
Allis-Chalmers Mfg. Co.  
United Tractor and Equipment Corp.  
Erie Steel Constr. Co.  
Hotchkiss Steel Prod. Co.  
McKiernan-Terry Corp.  
The Geo. Haiss Mfg. Co.  
American Steel & Wire Co.  
American Wire Fence Co.  
Fulton Bag & Cotton Mills  
Trackson Co.  
Detroit Harvester Co.

### H. KLEINHANS COMPANY

Union Trust Bldg. Pittsburgh, Pa.

#### Representing

NORTHWEST ENGINEERING CO.—Crawler Shovels and Cranes  
OHIO LOCOMOTIVE CRANE CO.—Locomotive Cranes  
G. H. WILLIAMS CO.—Clamshell Buckets  
MID-WEST LOCOMOTIVE WORKS—Gasoline and Diesel-Electric Locomotives  
BAY CITY FOUNDRY & MACHINE CO.—Truck Cranes

### W. J. DOORLEY

Scottdale, Penna.

#### Representing

Asphalt Equipment Co.  
Charleroi Iron Works  
Good Roads Equipment Corp.  
"All kinds of Asphalt Equipment"

### GIBBES MACHINERY COMPANY

Columbia South Carolina

#### Representing

CLEVELAND TRACTOR CO.—Tractors  
AMERICAN SAW MILL MACHINERY CO.—Woodworking Machinery and Equipment  
BAY CITY SHOVELS, INC.—Shovels, Cranes, Draglines and Tractor Shovels  
UNION STEAM PUMP CO.—Compressors and Pumps  
SKELTON SHOVEL CO.—Shovels and Scoops  
TOLEDO PRESSED STEEL CO.—"Toledo" Torches  
RICHMOND FORGING CO.—Grader Blades  
MARION STEAM SHOVEL CO.—Shovels, Gas, Electric, Diesel or Steam  
DOMESTIC PUMP CO.—Pumps, Road, etc.  
ATLAS SCRAPER CO.—Rotary Wheel Scrapers  
Also  
Road Graders and Rollers, Boilers, Steam and Gasoline Engines

### A. H. KRIGGER & COMPANY

4 E. Carson St. Pittsburgh, Pa.

#### Representing

ORTON Cranes and Shovels  
BROWN Gasoline Hoists  
REED-PRENTICE Sawing Machines  
BATES Crawler Tractors  
STOCKLAND Road Graders  
CLIMAX Gasoline Engines & Parts  
LE ROI Gasoline Engines & Parts  
GROUNDHOG Revolving Scrapers  
McCORMICK-DEERING Tractors  
IDEAL Power Lawn Mowers  
LEE Dump Bodies  
ACME Light Road Rollers

### ENSMINGER AND COMPANY

181 S. Washington St. Wilkes-Barre, Pa.

#### Representing

JAEGER Concrete Mixers, Towers, Pumps  
LINK-BELT Shovels, Cranes, Backfillers  
BAY CITY, Tractor Shovels  
SCHRAMM, INC. Air Compressors  
McCORMICK-DEERING Industrial Tractors  
BUTLER, Bins  
BLAW KNOX Buckets HUBER Rollers  
DOBBIE Derricks and Winches  
BURCH, Stone Spreaders, Unloaders, Conveyors  
NEW HOLLAND, Rock Crushers  
HIGHWAY SERVICE, Chip Spreaders  
JACKSON, Wheelbarrows and Concrete Carts  
AMERICAN Saw Mill Machinery  
ADAMS, Graders  
REED-PRENTICE, Timber Saws  
CLEVELAND Rock Drills, Air Tools  
WYOMING, Red Edge Shovels  
HOTCHKISS, Road Forms

### JEFF HUNT ROAD MACHINERY CO.

Columbia So. Carolina

#### Representing

"CATERPILLAR" Tractors  
"CATERPILLAR" Road Machinery  
REX Mixers, Pavers, Pumps  
THEW Shovels  
KILLEFER Farm Machinery Road Tools  
BURCH Loaders and Conveyors  
OED Finishing Machine Buckets  
BLAW-KNOX Road Forms, Bins  
PIONEER Gravel Equipment  
AUSTIN Trench Machines  
CLYDE Hoists and Derricks  
LAFLANT-CHOATE Dump Wagons  
ATHEY Trailers  
UNIVERSAL Cranes and Shovels  
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The Wickes Boiler Co.

And Other Leading Manufacturers

## D. S. MEADOWS COMPANY, Inc.

19 Church Ave., E. Roanoke, Va.

### Representing

CATERPILLAR TRACTOR CO.  
"CATERPILLAR" Harvesters  
"CATERPILLAR" Graders  
ATHEY TRUSS WHEEL CO.  
LA PLANT-CHOATE MFG. CO.  
KILLEFER MFG. CO.  
TOWERS & SULLIVAN MFG. CO.  
GENERAL EXCAVATOR CO.

## GEIJSBEEK ENGINEERING CO.

Arctic Building Seattle, Wash.

### Representing

HANSON Excavators  
FATE-ROOT-HEATH Crushers  
EAGLE Sand and Gravel Plants  
CHASE Industrial Cars  
HARDINGE Grinding Mills  
Pumps, Compressors, Drilling Tools  
Contractors' Scientific Instruments

## RICHMOND MACHINERY & EQUIP. CO.

Broadway Bank & Trust Bldg. Richmond, Va.

### Representing

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Connelly and Co.  
Construction Machinery Co.  
Ferguson and Co.  
Gallon Iron Works and Manufacturing Co.  
Good Roads Machinery Co.  
Manitowoc Engineering Works  
Mead-Morrison Manufacturing Co.  
Page Steel and Wire Co.  
Schramm Incorporated  
Virginia Metal Manufacturing Co.

## ROANOKE SALES CORPORATION

ROANOKE, VIRGINIA

Adams—Leaning Wheel Graders  
Cleveland—Crawler Tractors  
Newport—Metal Culverts  
Baker—Baker Maney Scrapers  
Buhl—Air Compressors  
Huber—Road Rollers  
Hardsoeg—Hammer Drills  
Wyoming—Red Edge Hand Shovels and Picks  
Wiard—Turn and Rooter Plows  
Full line of Wheeled and Drag Scrapers  
Blades for every make and size grader  
Rock Crushers  
Metal Traffic Bridge Lanes

## NORTHWEST APPLIANCES, INC.

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### Representing

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Wehr Company  
Anthony Company  
Ruckstell Sales & Mfg. Co.



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NORTHWEST—Gas and Electric Shovels, Cranes and Draglines  
 BLAW-KNOX—Clamshell Buckets, Steel Forms, etc.  
 TWIN DISC—Clutches for all purposes  
 PAGE—Scraper Buckets, Diesel Draglines  
 MINNEAPOLIS—"Twin City" Gas Engines  
 CLIMAX—Gasoline Engines  
 WISCONSIN—Gasoline Engines

Member: Associated Equipment Distributors

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Archer Iron Works  
 Bates Valve Bag Corp.  
 Blystone Mfg. Co.  
 Broderick & Bascomb Rope Co.  
 Buffalo-Springfield Roller Co.  
 Butler Bin Co.  
 Chain Belt Co.  
 D-A Lubricant Co.  
 DeWalt Products Co.  
 Elgin Sales Corp.  
 Fats-Root-Heath Co.  
 Climax Engineering Co.  
 Le Roi Co.  
 M & M Wire Clamp Co.  
 Fairbanks, Morse & Co.

Member: Associated Equipment Distributors

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 Cleveland Wheelbarrow Co.  
 General Excavator Co.  
 The Jaeger Machine Co.  
 Hercules Motors Corp.  
 Chicago Pneumatic Tool Co.  
 De Laval Steam Turbine Co.  
 John A. Roebling Sons' Co.  
 Smith Engineering Works  
 Bay City Shovels, Inc.

Member: Associated Equipment Distributors

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728-802 Mallon Avenue

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Road Building, Logging and Power Farming Equipment

*Representing*

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 Tractors — Graders — Harvesters

**SHOP — SERVICE****BLUEFIELD SUPPLY CO.**

Bluefield West Virginia

*Representing*

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 Ingersoll-Rand Co.  
 Novo Engine Co.  
 Koehring Co.  
 Insley Co.  
 Parsons Co.  
 Kwik-Mix Mixers  
 Serviced Premoulded Products Co.  
 American Saw Mill Machinery Co.  
 DeWalt Products Co.  
 Diamond Rubber Co.  
 E. I. DuPont De Nemours Co.  
 Rex-Watson Corporation

**GENERAL EQUIPMENT CO., Inc.**

414 No. Fourth St. Clarksburg, W. Va.

*Representing*

CATERPILLAR TRACTOR CO.—Tractors, Graders  
 DETROIT HARVESTER CO.—Street Sweepers, Mowers  
 KILLEFER MFG. CORP.—Plows and Discs  
 HUBER MFG. CO.—Gasoline Rollers  
 ATHEY TRUSS WHEEL CO.—Crawler Wagons  
 GARDNER-DENVER CO.—Compressors and Jackhammers  
 STERLING WHEELBARROW CO.—Wheelbarrows  
 BLAW-KNOX CO.—Road Forms, Batches, Bins, etc.  
 LA PLANT-CHOATE MFG. CO.—Bulldozers Snow Plows  
 AMERICAN CABLE CO.—Tru-Lay Rope  
 BURCH CORP.—Conveyors, Car Unloaders and Spreaders  
 NORTHWEST ENGINEERING CO.—Gasoline Shovels  
 BARNES MFG. CO.—Pumps  
 JAEGER MACHINE CO.—Concrete Mixers  
 HERCULES POWDER CO.—Explosives & Blasting Supplies  
 EUCLID CRANE MFG. CO.—Earth Moving Equipment.  
 ATECO—Dirtmovers, Bulldozers

**BAILEY-TREEN MACHINERY CO.**

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*Representing Sales-Service for the Following Internationally Known Material Moving Machinery Manufacturers*

Caterpillar Tractor Co.  
 Athey Truss Wheel Co.  
 LaPlante-Choate Mfg. Co.  
 Northwest Engineering Co.  
 Euclid Crane & Hoist Co.  
 Detroit Harvester Co.  
 Willamette Iron & Steel Works  
 Gardner-Denver Co.  
 The Huber Co.  
 W-K-M Co., Inc.  
 Erie Steel Construction Co.  
 The Bach Corporation  
 The Foote Co.  
 American Tractor Equip. Co.

**LA LANCE EQUIPMENT COMPANY**

Jackson Ave. and 15th St. Huntington, W. Va.

*Representing*

ADAMS Leaning Wheel Graders, Maintainers  
 BARBER-GREENE Loaders, Conveyors, Ditchers  
 REX Mixers, Pavers, Pumps, Saw Rips  
 CHAUSSE Asphalt and Tar Heaters, Etc.  
 COMMERCIALS-Way Bodies  
 FLORY Hoisting Engines, Cables, Derricks  
 HANSON Cranes, Shovels  
 LYLE Street, Highway Signs  
 HELTZEL Steel Forms, Bins  
 BARBER Asphalt Plants  
 LE ROI Gas Engines  
 THOR Air Compressors  
 MEAD-MORRISON Shovels  
 OWEN Buckets  
 PIONEER Gravel and Rock Crushing, Screening and Loading Plants  
 UNIVERSAL Crushers  
 VULCAN Gasoline, Diesel, Steam, Electric Locomotives  
 AMERICAN MANGANESE Steel Dredging Pumps  
 WONDER Mixers, Hoists  
 INDUSTRIAL-BROWN HOIST Locomotive Cranes  
 WAKESHA Gas Engines

**THE PORTER SUPPLY CO.**

P. O. Box 736 Huntington, W. Va.

*Representing*

BUCYRUS-ERIE CO., Steam, Gas and Diesel Shovels  
 ALLIS-CHALMERS "Monarch" Tractors  
 J. D. ADAMS CO., Graders  
 THE HUG CO., Dump Trucks  
 SULLIVAN Compressors, Tools  
 DOMESTIC Pumps and Hoists  
 BLAW-KNOX Bins, Batches and Forms  
 A. W. FRENCH CO., Finishing Machines  
 CONNERY Asphalt Heaters  
 GOODALL Rubber Hose  
 BUFFALO-SPRINGFIELD Rollers  
 IOWA MFG. CO., Sand and Gravel Screen Plants  
 GEO. D. WHITCOMB Locomotives  
 WESTERN Dump Cars  
 HAZARD Wire Rope  
 M-W Lubricants  
 W. K. M. COMPANY INC.  
 NATIONAL CARBON CO., Graphite Grease

**WISCONSIN CRAWLER TRACTOR CO.**

Madison Wisconsin

*Representing*

SLUSSER-McLEAN Scrapers  
 EDWARDS Graders  
 SARGENT Snow Plows  
 SMITH Wagons  
 RYAN Graders  
 SCHRAMM Compressors

**Badger Tractor & Equipment Co.**

35 25th St. Milwaukee, Wisc.

*Representing*

Allis-Chalmers Mfg. Co.  
 Galion Iron Works & Mfg. Co.  
 Diamond Iron Works, Inc.  
 Baker Mfg. Co.  
 Sidney Steel Scraper Co.  
 Wausau Iron Works  
 "Monarch" Plows  
 Killefer Scrapers, Rippers  
 Davenport Locomotive & Mfg. Corp.

**BOEHCK MACHINERY CO. INC.**

2404 W. Clybourn St., Milwaukee, Wis.

*Representing*

INSLEY Steel Towers, Excavators  
 T. L. SMITH Pavers  
 PARSONS Ditchers  
 KOEHRING Shovels, Pavers, Dumpers  
 C. H. & E. Hoists, Pumps  
 KWIK-MIX—Mixers  
 JOHNSON Bins  
 ALLIS-CHALMERS Motors, Pumps  
 WILLIAMS Buckets  
 WILLIAMS Trailers  
 INGERSOLL-RAND Air Compressors  
 J. P. CURRY Wire Tie  
 TOEPPER Screening, and Conveying Equipment  
 SYMONS Column Clamps  
 WAKESHA Industrial Power Units  
 UNION Pile Hammers  
 CEDAR RAPIDS Cranes  
 BAY CITY Truck Cranes

Member: Associated Equipment Distributors

**CHADWICK MACHINERY CO.***Contractors' Equipment*

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*Representing*

Barber-Greene Co.  
 Broderick & Bascomb Rope Co.  
 Drake-Williams-Mount Co.  
 Independent Pneumatic Tool Co.  
 Leach Company  
 Manitowoc Engineering Works  
 Mead-Morrison Mfg. Co.  
 Owen Bucket Co.  
 Sterling Machinery Corp.

**CUNNINGHAM-ORTMAYER CO.**

15 Michigan St. Milwaukee, Wis.

*Distributors*

BUTLER—Bins and Measuring Devices  
 CAREY—Elastic Joints and Building Materials  
 COLPHALT—Asphalt Emulsions  
 CONCRETE ENGR. CO.—Reinforcing Steel and Accessories  
 DOWFLAKE—Calcium Chloride  
 HUBBARD—Guard Rail Fittings  
 JAEGER—Concrete Mixers, Transit Mixers, Pumps & Hoists  
 LAKEWOOD—Road Finishers, Subgraders, Chuting Equipment  
 LITTLEFORD—Road and Street Maintenance Equipment  
 NATIONAL—Air Compressors, Crawler Tractors  
 SERVICE—Hand Shovels, Scoops and Spades  
 SISALKRAFT—Waterproof Paper  
 STERLING—Wheelbarrows  
 THEW-LORAIN—Gasoline Shovels, Cranes  
 UNIVERSAL—Truck Cranes  
 WEHR—Rollers, Power Graders  
 WILLIAMS—Form Clamps and Accessories  
 Member: Associated Equipment Distributors

**N. B. GUTHRIE**  
Springfield, West Virginia*Representing*

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 Bay City Shovels, Inc.  
 W. A. Riddell Co.  
 Frick Co.

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## DROTT TRACTOR CO., INC.

3769 Wisconsin Avenue  
Milwaukee Wisconsin

### Representing

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HI WAY SERVICE CORP.—"Wausau" Snow Plows and Equipment  
ILLINOIS WIRE & MFG. CO.—"Big Red" Snow Fence  
EUCLID CRANE & HOIST CO.—Crawler Wagons, Wheel and Rotary Scrapers  
PIONEER GRAVEL EQUIPMENT MFG. CO.—Gravel Handling Equipment and Crushers

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British Columbia  
Manitoba  
Ontario  
Quebec  
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Vancouver, British Columbia, Canada  
All Types Municipal Supplies and Construction Equipment

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Road Machinery  
BRYAN DONKIN CO. LIMITED—Chesterfield, Eng.  
Gas Equipment Specialists  
FRANCIS PANKIN & CO. LTD.—Montreal, Quebec  
Water Meters, Etc.  
RANSOMES SIMS & JEFFERIES LTD.—Lapwich, Eng.—Lawn Mowers  
DENNIS BROS., LIMITED—Guilford, England—Lawn Mowers  
GUEST & CHRIMES LIMITED—Rotherham, Eng.  
Water Meters, Etc.  
WITTE ENGINE WORKS—Kansas City, Mo.—Gasoline Saws, Pumps & Engines  
BUCHYRUS-ERIE CO.—So. Milwaukee, Wis.—All types of Excavators  
CONSTRUCTION MACHINERY CO.—Waterloo, Ia.  
Concrete Mixers, Hoists  
SOLANO IRON WORKS—Berkeley, California—Revolving Fresno, Etc.

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Warehouse: West Allis  
Wisconsin

### Distributors for Wisconsin

SPEEDER—Shovels and Cranes  
BESSER—Concrete Products, Machinery and Mixers  
STERLING—Gas and Electric Hoists  
REMMEL—Concrete Mixers  
BELMONT—Mechanical Packing  
WHITING—Leather Belting

## THE CENTRAL GARAGE

Medicine Hat Alberta, Can.

### Representing

CATERPILLAR TRACTOR CO.—Tractors and Road Machinery  
LA PLANT-CHOATE MFG. CO.—Bulldozers and Wagons  
KILLEFER MANUFACTURING CO.—Scrapers and Road Rippers  
ATECO—Dirt Movers, Bulldozers, Tamping Rollers and Scarifiers  
Also  
Horse Drawn Road Maintenance Machines  
Fresnos, Scrapers, Etc.

## DOMINION EQUIPMENT and SUPPLY COMPANY, Ltd.

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Hauck Manufacturing Co.  
P & H Company  
Clyde Iron Works  
Diamond Iron Works  
London Concrete Machinery Co.  
Sauerman Brothers, Inc.  
A. Leschen Sons & Co.  
Geo. Haiss Mfg. Co.

## HUNTER MACHINERY COMPANY MILWAUKEE, WIS.

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CHAIN-BELT Mixers, Pavers  
Pumps, Saw Rigs, Elevators  
CLYDE Hoists, Derricks  
BLAW-KNOX Buckets, Bins and Road Forms  
NORTHWEST Cranes, Shovels  
HOMELITE Portable Pumps  
LESCHEN Wire Rope  
AUSTIN Trenching Machines  
SASGEN Derricks  
LE ROI Engines  
WESTERN Wheeled Scrapers  
CARBIC Lights  
Member: Associated Equipment Distributors  
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ATLAS Adjustable Shores  
ARCHER Tubular Towers  
SYNTRON Electric Hammers  
BUFFALO-SPRINGFIELD Rollers  
ORD Finishing Machines  
SAUERMAN Draglines, Cableways  
AEROIL Burners  
PULSOMETER—Steam Pumps  
M & M Column & Form Clamps, Shores

## FERGUSON SUPPLY CO., Ltd. CALGARY, ALBERTA

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Northwest Engineering Co.  
Page Engineering Co.  
B. Greening Wire Co., Ltd.  
London Concrete Mch. Co., Ltd.  
Canadian Mead-Morrison Co., Ltd.  
Herbert Morris Crane & Hoist Co. Ltd.  
Worthington Pump & Mch., Corp.  
Templeton, Kenly & Co., Ltd.  
Federal Belting & Asbestos Co., Ltd.  
Moon Manufacturing Co.  
Factory Equipment Ltd.  
J. L. Goodhue & Co., Ltd.  
Jeffrey Manufacturing Co.  
Elevating Graders, Dumps Wagons, Fresnoes, Scrapers, Plows, etc.

## KIPP-KELLY, Ltd.

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### Representing

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GARDNER-DENVER—Air Compressors, Tools  
KELLER Pneumatic Riveters, Calkers, Drills  
LIDGERWOOD—Hoists, Derricks, Excavators, etc.  
ORENSTEIN & KOPPEL—All Types Industrial Cars  
PETTERS—Oil Engines and Generating Sets  
WHITCOMB—Gasoline, Oil, Electric Locomotives  
MORRIS—Cranes, Hoists, Blocks, Crane Trucks  
KNOX—Valves, Hose Couplings, Etc.  
S. K. F.—Drill Steel, Special Steels  
LOCKWOOD—Outboard Motors, All Sizes  
JAEGER—Mixers and Contractors Equipment  
R. HOOD HAGGIE—Steel and Wire Cable  
STANDARD—Diamond Drills  
McKERNAN-TERRY—Pile Hammers, Core Drills  
MITCHELL—Electric Vibrating Screens  
—REPAIR PARTS AND SERVICE SHOPS—

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534 No. 25th St. Milwaukee, Wis.

### Representing

BYERS—Shovels, Cranes, Draglines  
METALWELD-WORTHINGTON—Portable Air Compressors, Air Tools  
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STERLING—Wheelbarrows  
ERIE—Bins, Clamshell Buckets

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CASEY JONES Speeders  
CEDAR RAPIDS Gravels Plants, Crushers  
CLETRAC Tractors  
GALION Road Machinery  
HAISS Mechanical Loaders and Excavators  
HUMDINGER Pumps  
PLYMOUTH Gas and Diesel Locomotives  
SAUERMAN Scrapers and Excavators  
SCHRAMM Compressors

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ARCHER Tower Hoist Equipment  
BLACKMER Pumps  
CONSOLIDATED Concrete Machinery  
FOOTE Pavers  
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Concrete Mixers—Tilting and Non-Tilting  
Concrete Block Machines  
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EVERYTHING FOR THE CONTRACTOR

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LaPLANT-CHOATE Snow Removal and Dirt Moving Equipment  
KILLEFER Scrapers, Fresnoes & Road Rippers  
ATHEY TRUSS Wheel Wagons  
EUCLID Crane and Hoist Equipment  
MacWHYTE Wire Rope  
OIL FIELD Hoists and Equipment  
GOOD ROADS Champion Sand & Gravel Equip.  
WARD Road Plows  
WAUSAU Bulldozers, Snow Plows and Back Fillers  
SPEEDER Draglines and Shovels  
MASTER Loaders and Rotary Scrapers  
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BRITISH COLUMBIA DISTRIBUTORS FOR  
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American Tractor Equip. Co.  
LaPlant-Choate Mfg. Co.  
Athey Truss Wheel Co.  
Killefer Mfg. Corp.  
Rotary Snow Plow Co.  
Detroit Harvester Co.

## TRUCK & TRACTOR EQUIPMENT CO., LTD.

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Hydraulic Hoist Mfg. Co.  
Trackson Co.  
W. A. Riddell & Co.  
Universal Power Shovel Co.  
Pierce Governor  
McCormick-Deering Tractors  
Sergeant Snow Plows  
Hughes-Keenan Iron Mules  
Olson Extensions  
Rock Hand Hoists  
Perry Scraper Co.  
Kingham Trailers  
Brookville Locomotives  
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**Vulcan Asphalt & Supply Co., Ltd.**

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Thos. Moulding Floor Co.

The Iroquois Mfg. Co.

The Pacific Lumber Co. of Ill.

The Texas Company.

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Davey Compressor Co.

Hughes-Keenan Co.

General Excavator Co.

International Harvester Co.

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Osgood Company

Sawyer-Massey Co.

(Road Machinery Division)

Trackson Company

Universal Power Shovel Co.

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Rosetown

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LaPlant-Choate Mfg. Co.

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Ransome Concrete Machinery Co.  
Orr & Sombower, Inc.  
Barnes Manufacturing Co.  
Cleveland Tractor Co.  
Frink Snow Plows  
Rotary Snow Plows  
Austin Manufacturing Co.  
Butler Bin Co.  
Bartlett & Snow Co.  
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**MUSSENS LIMITED**

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Toronto — Winnipeg — Vancouver

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Byers Shovel and Cranes

Duff-Norton Jacks

Elgin Street Sweepers

Flory Hoists

Heltzel Steel Forms and

Agricultural

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Mario Pumps

Morse Diving Apparatus

Pennsylvania Pump &amp; Com-

pressor Co.

Pulsometer Pumps

Reading Chain &amp; Block Corp.

Rogers Heavy-Duty Trailers

Sanderson Cyclone Drills

Smith Mixers

Sterling Wheelbarrows

Union File Hammer

Vulcan Locomotives

Western Blocks

**THE TRACTOR & THRESHER CO., Ltd.**

38 Twenty-third Street

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KILLEFER Farm &amp; Road Machinery

LENHART Dump Wagons

HOLT Combined Harvesters

LaPLANTE-CHOATE Machinery

**GENERAL CONSTRUCTION MATERIAL CO., LTD.**834 St. James St., W. Montreal, P. Q.  
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"A. W."—Traffic Treads for

Bridges

"SOLVAY" Calcium Chloride

COLEMAN—Four-wheel and

Six-wheel-drive Trucks

DIAMOND—Sand &amp; Gravel

Equipment, etc.

DYER—Welding Machines—

Electric

FREEMAN—Truck Turn-

tables

GALION—Road Machinery

SHUNK—Graders and Drag

Blades, etc.

STERLING—Hoists, Pump

and Air Compressors

SHAW - ENOCHS — Pull-

Type Power Graders and

Maintainers

S. C. DANIELS—Snow Fence

for Tractors and Trucks

MAINE—Snow Plows for

Tractors and Trucks

NEW ENGLAND — Power

Loaders, etc.

**CLARE OSBORN LIMITED**

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Nordberg Mfg. Co.

McKiernan-Terry Corp.

Ransome Concrete Machinery Co.

Western Wheeled Scraper Co.

Cincinnati Car Corporation

Owen Bucket Co.

Morris Machine Works

American Terry Derrick Co.

Metalweld, Incorporated

**MEXICO ARIZONA TRADING CO., S.A.**

Nogales, Sonora

Ciudad Obregon, Sonora

Culiacan, Sinaloa

(Export Office: Nogales, Arizona)

*Representing*

"CATERPILLAR" Tractors

"CATERPILLAR" Harvesters

"CATERPILLAR" Road Machinery

ATHEY Truss Wheels

KILLEFER Tools and Implements

WILLAMETTE-ERSTED Hoists

GMC Trucks

POMONA Pumps

SANDWICH Corn Shellers

VENTURA Scarifiers and Implements

ATECO Bulldozers

BEAN Implements

**F. H. HOPKINS & CO., LTD.**

760 Victoria Square

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159 Bay Street

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ALLIS-CHALMERS — Trac-

tors, Engines

BUHL—Compressors

BUDA—Engines

HAISS—Excavators, Loaders

FATE-ROOT-HEATH — Lo-

comotives

HIGHWAY—Big Sandy and

HUBER—Road Rollers

INDUSTRIAL—Cranes

JORDAN—Scrapers

KOPPEL—Industrial Cars

DOBBSIE Derricks, Winches

NOVO—Pumps

LAKEWOOD - JAEGER —

Concrete Mixers, Chuting

Plants, Graders and Road

Finishing Machinery

MARION—Steam, Gas, Elec-

tric, Diesel Shovels, Drag-

lines

SAUERMAN—Power Drag

Scrapers, Cableways

ELLICOTT Dredges and

Dredging Machinery

UNIVERSAL—Crushers

BAY CITY—Truck Cranes

KEYSTONE—Drills

**GRAY-CAMPBELL, LTD.**

Moose Jaw, Saskatchewan, Canada

*Representing*

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Tractors—Graders—Combines

Williamette-Ersted Co.

La Plant-Choate Mfg. Co.

**LAMOREUX-KELLY, LTD.**

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Fruehauf Trailer Co.

Wood Hydraulic Hoist &amp; Body Co.

National Steel Car Co.

**THE ALBERT OLSON CO. LTD.**

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REGINA SASKATCHEWAN CANADA

*Representing*

"CATERPILLAR" Tractors

"CATERPILLAR" Road Equipment

"CATERPILLAR" Combined Harvesters

TONCAN Metal Culverts

PIONEER Gravel Equipment

LENHART Dump Wagons

LAPLANT-CHOATE Equipment

KILLEFER Scrapers

EUCLID Equipment

**CARDOZE & LINDO**

P. O. Box 112

Panama, Rep. of Panama

*Representing*

Caterpillar Tractor Co.

Williamette Ersted Co.

Athey Truss Wheel Co.

Ateco Equipment

Killefer Mfg. Co.

LaPlant-Choate Co.

Harnischfeger Corp.

Leschen Wire Rope

Chain Belt Co.

Atlas Conveyors

Marlow Mud Hog Pumps

Fairbanks-Morse &amp; Co.

York Ice Machy., Corp.

Sullivan Machy., Co.

J. A. Fay &amp; Egan Co.

Outboard Motors Corp.

Gray Marine Motor Co.

F. E. Myers &amp; Bro., Co.

Westinghouse Electric

U. S. Rubber Export Co.

National Carbon Co.

Reo Motor Car Co.

**MILIAN MACHINERY CO., S. A.**

Havana

Cuba

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Chain Belt Co.

D-A Lubricant Co.

The Martin Wagon Co.

The Barnes Mfg. Co.

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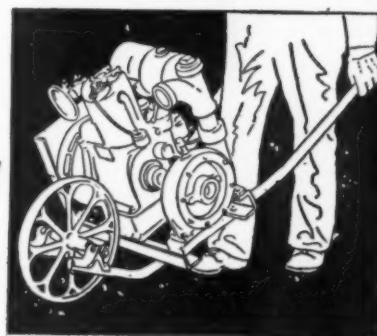
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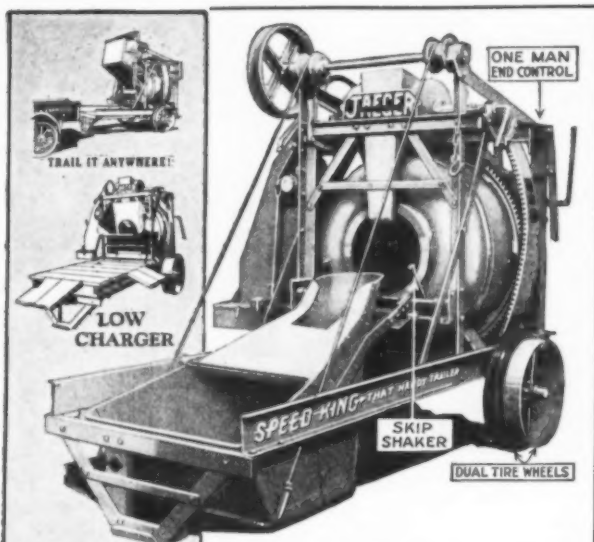
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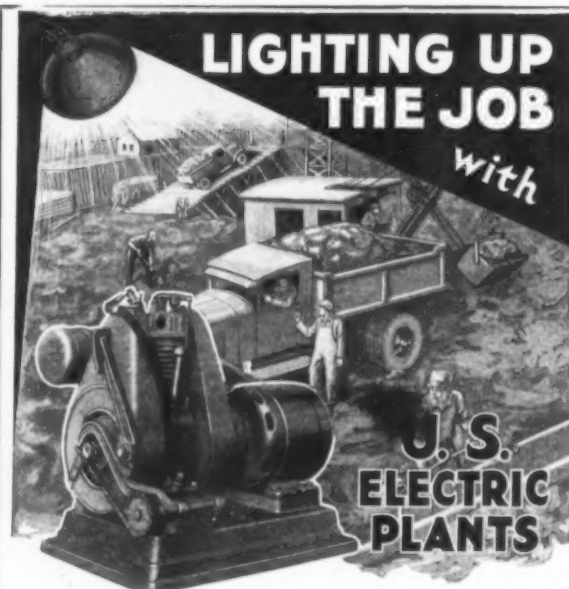
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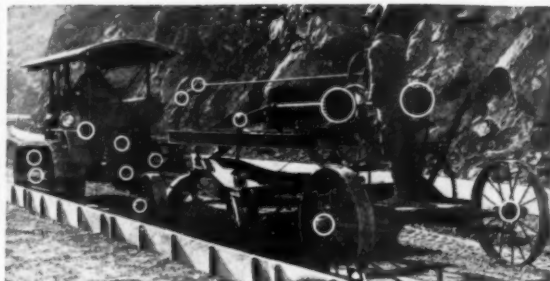
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The Where to Purchase section in the front part of **CONTRACTORS AND ENGINEERS MONTHLY** is a very valuable aid to Contractors and Builders who are planning to purchase new equipment.

You may secure catalogs by writing direct to the manufacturers listed, or send a list to us and we will have them forwarded to you.

Replacing rigid type drain  
culverts, on Dixie Highway,  
north of Falmouth, Ky.

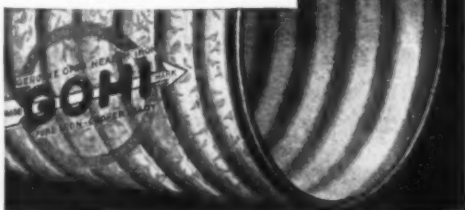
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(Meet copper-bearing pure iron  
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copper.

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The services of the Standard Oil Company engineers are available to those who wish further details on this type of construction.

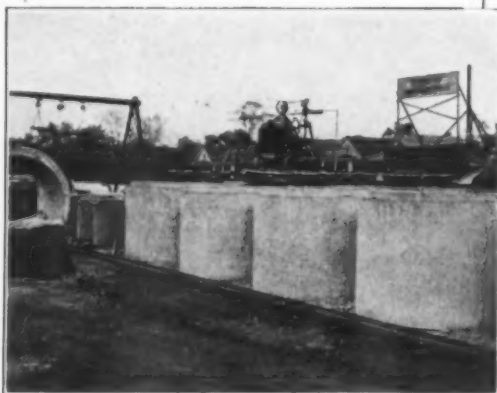
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# Newark

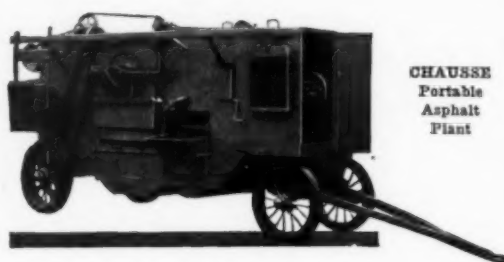
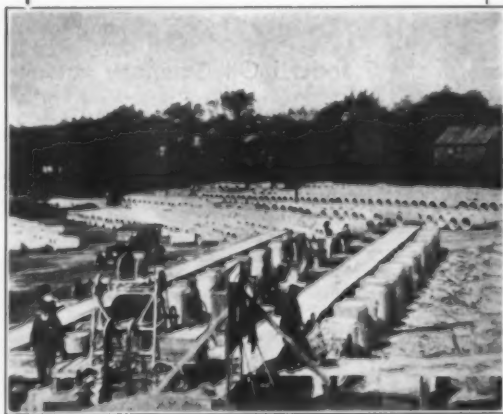
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with perfect  
flow line.**



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CHAUSSE  
Portable  
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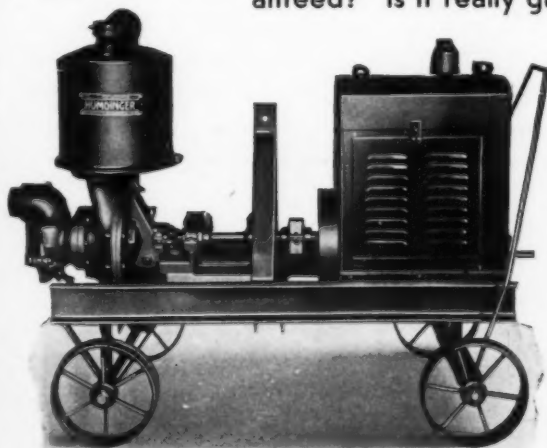
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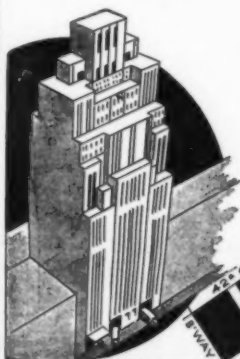
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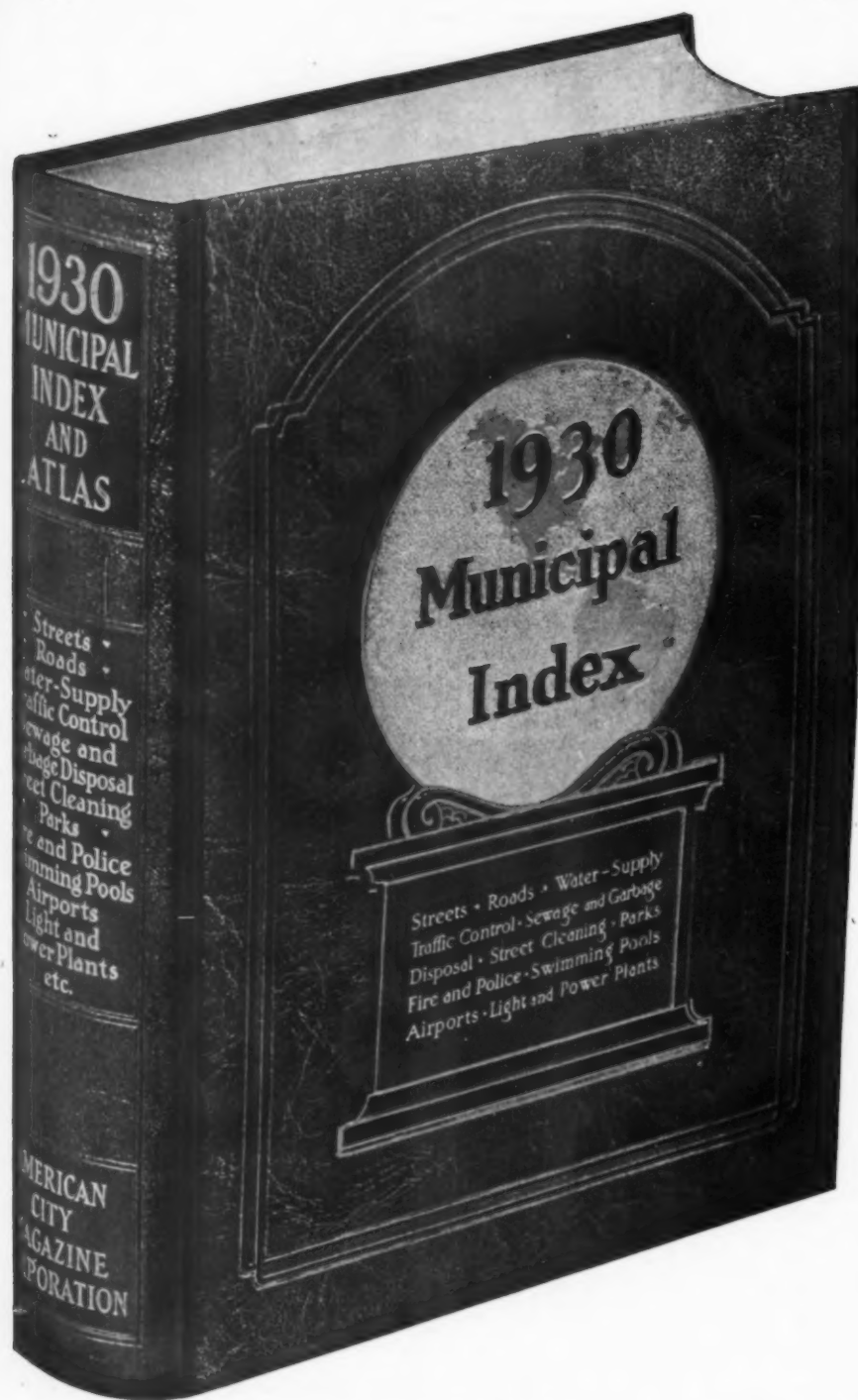


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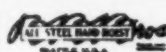
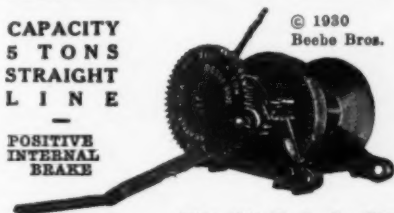
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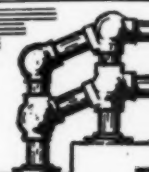
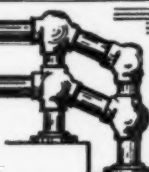
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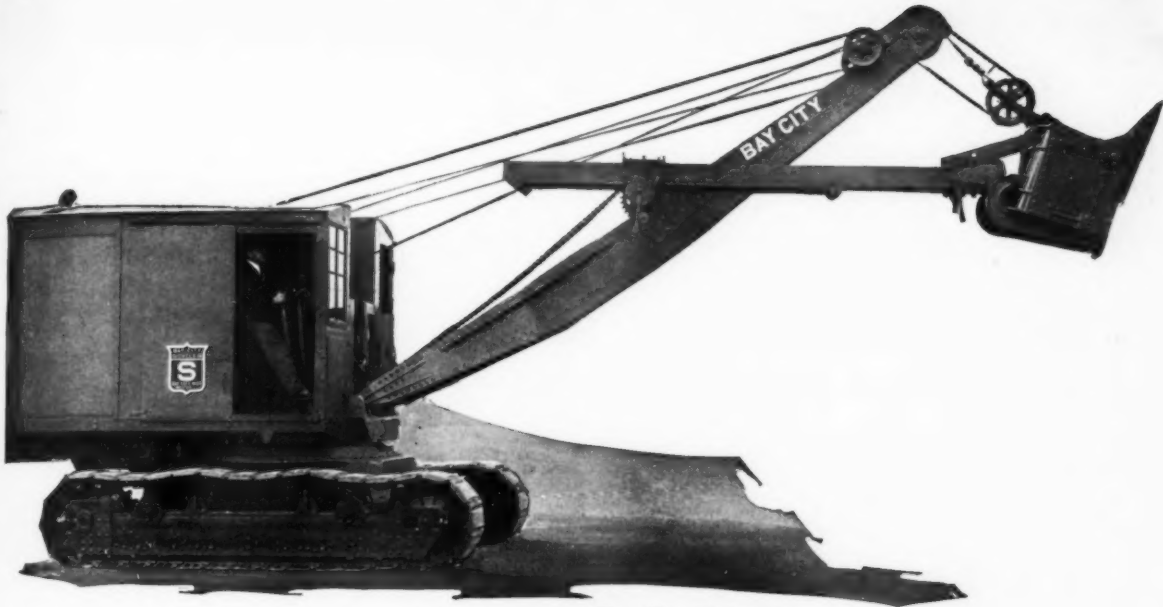
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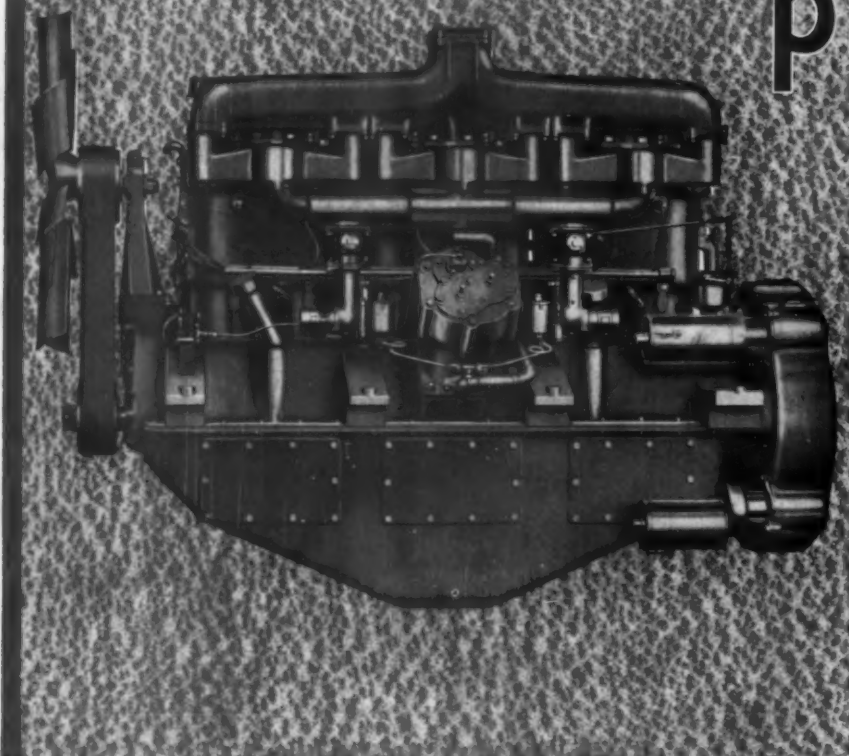
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